

COMPENDIUM OF INDIAN MEDICINAL PLANTS

Ram P. Rastogi
B.N. Mehrotra

VOLUME 4
1985-1989



Central Drug Research Institute
Lucknow
and
Publications & Information Directorate
New Delhi

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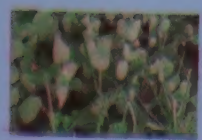
ABOUT THE COMPENDIUM VOL. 4

This detailed treatise is written for botanists, chemists and biologists as companion volume to "Glossary of Indian Medicinal Plants" by Chopra, Nayar & Chopra and covers the five-year period 1985-89. Volume I (1960-69) was published during February 1990 and Volume 2 in April 1991. The reprint editions of these volumes have come out in 1993 which contain a new index of chemical structures. Vol.3 (1980-84) was published in May, 1993 and has been reprinted in 1995. Thus, these volumes have four indexes each.

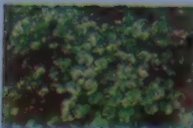
The format followed for Vol.4 is similar to that of Vols 1, 2 and 3, i.e. the write-up on each plant also includes new type of data/information, viz. chemical structures of new compounds isolated and the biological work on pure constituents isolated from a plant.

The first part of Vol.4, like preceding volumes, presents the logistics of the write-up in an 'Explanatory Introduction', which is followed by the description of 1650 plants in 780 pages. Finally, four indexes (150 pages) comprising local names, chemical constituents, biological activities and chemical structures have been provided.

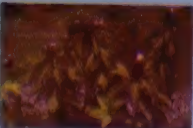
These volumes will be welcomed by all those working on medicinal plants/natural products who will appreciate that such a wealth of information has been assembled in a classified manner in a single volume. Volume 5 covering the five-year period 1990-94 is under preparation.



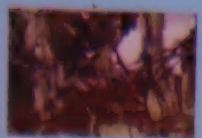
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Centella asiatica



Costus speciosus



Abrus precatorius

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VOL. 4

1985-1989

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Editor : Ram P. Rastogi
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COMPENDIUM OF INDIAN MEDICINAL PLANTS VOLUME 4 1985-1989

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EXPLANATORY INTRODUCTION

SCOPE

This Compendium has been designed as a companion volume to the Glossary of Indian Medicinal Plants by Chopra, Nayar & Chopra (hereinafter referred to as Glossary). All the plants have been listed in alphabetical order and reference to the Glossary has been given for those plants which are included therein; in the case of new plants, not listed in the Glossary, their local name and distribution has also been included, wherever known, in keeping with the pattern of the Glossary. The distributional range of such plants has been confined to the present political boundary of India. Bhutan and Nepal have also been included because these countries fall within the unbroken chain of the Himalayas and some of the Himalayan species occur in contiguous territories in India, Bhutan and Nepal. Certain plants, although not found in India, are included either because these were listed in the Glossary or are sold in the indigenous drug market in India.

The literature cited is on the basis of complete screening of Chemical Abstracts and Biological Abstracts and covers the five-year period from 1985 to 1989. It has been aimed to make the Compendium exhaustive by including research done anywhere in the world on the taxa found in India, whether indigenous or introduced.

LITERATURE CITATION

The abbreviations of the reference citations are in accordance with the practice followed in Chemical Abstracts and Serial Sources for the Biosis Data Base, Volume 1985. Since many journals, especially those published in Latin American, African and South-east Asian countries, are not available in most Indian libraries and some journals have stopped publication or have changed their names, cross-references to Chemical Abstracts have been given in such cases.

BOTANICAL NOMENCLATURE

Since the nomenclature of many plants has undergone revision in the preceding decades, the names of plants, including those given in the Glossary and in the cited references, have been updated as far as possible to provide currently accepted names. In cases of change of name, the obsolete names have been given as synonyms according to the following order : the currently accepted name is followed by the name given in the Glossary and then by the corresponding name listed in Hooker's Flora of British India or other subsequent relevant literature as addition to Indian flora (if it is different from the name listed in the Glossary), and finally by the title name of the plant given in the reference cited, if it is different from the earlier mentioned names. Similarly, the names of the natural orders (families) have also been revised wherever required according to the currently accepted pattern.

There is divergence of opinion among Indian botanists on the merits of maintaining or splitting of a few large genera like Bauhinia, Euphorbia and Pylygonum. In this Compendium, therefore, their existing generic status has been maintained.

The plant names mentioned under synonymy, in case of name change, have been incorporated in the text in their alphabetical order and cross references to their currently accpeted names have been given to facilitate search for any particular plant on which information may be required.

STRUCTURES

Structures of some substances have been revised and in many cases absolute stereostructures have been determined in the post-1989 years. To provide complete information to the readers and also to avoid duplication in the fifth volume (1990-1994), an attempt has been made to include the latest structures with the relevant post-1994 references, wherever applicable.

INDEXES

Besides indexes of local names and of chemical substances isolated, two additional indexes namely biological activities and chemical structures, were provided in preceding volumes 1, 2 and 3 to enhance the usefulness of the Compendium to all classes of readers. It may be mentioned that the indexes of chemical structures pertaining to Vols. 1 and 2 were compiled and given as addenda in reprint editions of these volumes. Thus, all the volumes contain four indexes each.

In the index of chemical compounds trivial names have been used, wherever given, and no attempt has been made to include systematic names. Synonyms, as far as they have come to our knowledge, have been included in the index via "see". Substances not named by their discoverers have been listed simply by plant origin, e.g. 'Aesculus triterpene glycoside'. Since the list contained about 7200 entries, help of computer has been taken to prepare an alphabetical list. A suitable computer programme has been developed for this purpose. Thus, the name of the com-

pound is arbitrarily divided into 3 components - the basic name, the prefixes such as (+), (-), D, L, cis, trans, α , β etc. and the substituents. Each substance has been indexed as far as possible under its basic name. For example : d- α -cadinene is indexed as cadinene,d-alpha-; O-demethyl- β -lumicolchicine as lumicolchicine,beta-,O-demethyl; 2-methyl-5-methoxy-1,4-naphthoquinone as naphtho-quinone,1,4-,2-methyl-5-methoxy.

SPECIAL FEATURES

In view of the fact that since 1960 researches on plants, both from the chemical and biological aspects, have been much more exhaustive than earlier, the pattern of the write-up on each plant has been suitably modified to include the new type of data / information. Besides summarising the results of biological evaluation of total extracts and fractions thereof and of chemical studies, each write-up has two new sections wherever necessary. A section on 'Biological Activity' gives a summary of all the pharmacological, biological and clinical work done on the pure constituents obtained from a plant. Similarly, a section on 'New Compounds' gives the complete structures of any new substances isolated. It is hoped that these two new sections would add immensely to the usefulness of the Compendium by highlighting the results of chemical and biological studies on each plant in a systematic manner.

**Central Drug Research Institute
Lucknow
July, 1995**

**Ram P. Rastogi
B. N. Mehrotra**

ACKNOWLEDGEMENTS

The editor would like to take this opportunity to express his gratitude to the Director General, Council of Scientific and Industrial Research, New Delhi, for sanctioning the project under which this Compendium series was undertaken. The first, second and third volumes of this series which were published in 1990, 1991 and 1993 respectively were well received; first and second volumes have been reprinted in 1993. I am also thankful to Dr. V. P. Kamboj, the Director of the Central Drug Research Institute, Lucknow, for providing financial assistance and all the infrastructural facilities for the completion of the present volume.

Thanks are due to Dr. S. Bhattarcharji, former Dy. Director, CDRI, Lucknow, for his invaluable help in correction of the manuscript and to Dr. K. B. Mathur, the former scientist-incharge, and Dr. O. P. Tripathi, the present scientist-incharge of the Library for their whole-hearted cooperation in providing the Library facilities. I also thank the staff of the project - Mr. R.C. Dwivedi, Mr. D.N. Vishwakarma and Miss Treesa V.L. for typing the manuscript and generally assisting in making it ready for the press; Mr. Dwivedi has also done the computer processing of the indexes.

I would particularly like to acknowledge the personal interest and support of Dr. V.P. Kamboj and Dr. B.N. Dhawan, former Director, CDRI, Lucknow, towards the publication of these volumes. I am thankful to Dr. G.P. Phondke, Director, Publication & Information Directorate, CSIR, New Delhi, for expeditious publication of these volumes.

RAM P. RASTOGI

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INDIAN MEDICINAL PLANTS

1-780

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ABELMOSCHUS (Malvaceae)

A. esculentus (L.) Moench. syn. *Hibiscus esculentus* L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 1).

Okra-mucilage R, isolated from roots, found to be a partially acetylated polysaccharide composed of rhamnose, galactose, galacturonic acid and glucuronic acid in molar ratio of 1.1:1.9:1.0:1.0 (*Chem. Pharm. Bull.* 1985, 33, 3330); malvalic, sterculic and vernolic acids identified in seed oil (*Fette Seifen Anstrichm.* 1986, 88, 459; *Chem. Abstr.* 1987, 106, 30056 x); quercetin and hyperin identified in ripe fruits; hydrolysis of fruit extract yielded glucose and glucuronic and galacturonic acids (*Khim. Pri. Soedin.* 1987, 451; *Chem. Abstr.* 1987, 107, 151268 x).

ABERIA (Flacourtiaceae)

A. caffra Harv. & Sond.; see *Doryalis caffra* Warb.

ABIES (Pinaceae)

A. excelsa DC.; see *Picea abies* (L.) Karst.

A. pindrow Royle syn. *A. webbiana* Lindl. var. *pindrow* (Royle) Brand. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 1).

Friedelin, taraxerol, β -amyrin and ursolic acid identified in heartwood (*Indian Drugs* 1987, 24, 232).

A. spectabilis (D.Don) Mirb. syn. *A. webbiana* Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 2).

Betuloside and methyl betuloside isolated from leaves (*Planta Med.* 1987, 53, 219; *Fitoterapia* 1987, 58, 56); n-triacontanol and β -sitosterol also obtained from leaves (*Fitoterapia* 1987, 58, 56).

A. webbiana Lindl.; see *A. spectabilis* (D.Don) Mirb.

A. webbiana Lindl. var. *pindrow* (Royle) Brand.; see *A. pindrow* Royle

ABRUS (Papilionaceae)

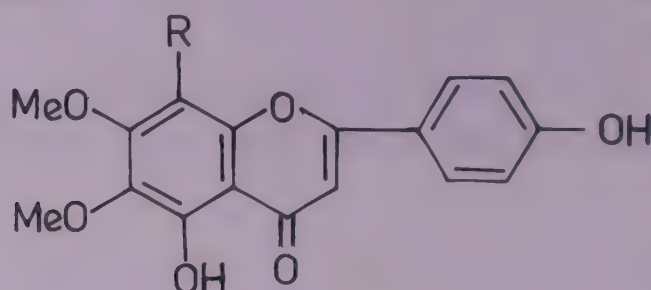
A. precatorius L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 2).

Seed extract (1.0 mg/ml/day, i.p.) showed antispermatogenic activity in rat. Total protein

in seminal vesicle was significantly decreased indicating inhibitory effect of extract; depletion of sialic acid in epididymis, seminal vesicle and testis induced loss of viability, reproductive ability and motility of sperm significant increase in cholesterol in testis affected sperm output and fertility. Rise of alkaline and acid phosphatases associated with inhibition of spermatogenesis or disintegration of germinal epithelium (*Indian Med. J.* 1987, 81, 157).

4,5,7-Trihydroxyflavan and taxifolin-3-glucoside isolated from leaves (*Herba Hung.* 1988, 27, 27; *Chem. Abstr.* 1988, 108, 164768 f); abrusin and its 2''-O-apioside isolated as new minor components from seeds (*Phytochemistry* 1989, 28, 299).

NEW COMPOUNDS



Abrusin

R = Glu

Abrusin-2''-O-apioside

R = Glu(2→1)Apiose

ABUTILON (Malvaceae)

A. glaucum (Cav.) Sweet; see *A. muticum* (DC.) Sweet

A. indicum G.Don; see *A. indicum* (L.) Sw.

A. indicum (L.) Sw. syn. *A. indicum* G.Don (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 4).

Fixed oil from roots showed significant analgesic activity (*Indian Drugs* 1984, 22, 69).

Gallic acid isolated (*Indian Drugs* 1989, 26, 333).

BIOLOGICAL ACTIVITY

Gallic acid at 0.1 g/kg, i.p., showed analgesic activity in rat within 30-45 min (*Indian Drug* 1989, 26, 333).

A. muticum (DC.) Sweet syn. *A. glaucum* (Cav.) Sweet, *A. pannosum* (Forst.f.) Schlect (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 4).

Total flavonoids in fruits of plant from Rajasthan estimated as 0.18%; leaves and fruit contained kaempferol and quercetin as major flavonoids (*Indian J. Pharm. Sci.* 1988, 50, 133).

Note : *A. pannosum* (Forst.f.) Schlect is currently accepted valid name for this taxon.

A. pannosum (Forst.f.) Schlect; see *A. muticum* (DC.) Sweet

A. ramosum (Cav.) Guill. & Perr.

Linoleic (42.55), oleic (23.72), palmitic (19.1), stearic (6.53), malvalic (2.48), sterculic (1.29), myristic (1.0), linolenic (0.91) and palmitoleic (0.51%) acids determined in seed oil by GLC (*Fette Seifen Anstrichm.* 1986, 88, 94; *Chem. Abstr.* 1986, 104, 183355 c).

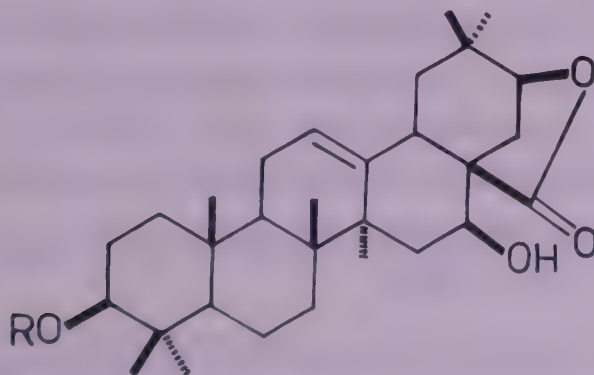
Distribution : Bundelkhand in Uttar Pradesh, Rajasthan, Gujarat and Tamil Nadu.

ACACIA (Mimosaceae)

A. auriculiformis A.Cunn. ex Benth. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 2).

Seed fatty acids contained 4.9% of C18:1 epoxy acids (*J. Am. Oil Chemists Soc.* 1983, 60, 1893; *Chem. Abstr.* 1984, 100, 3559 h); vernolic acid (4.2%) present in seed essential oil (6.1%) (*J. Oil Technol. Assoc. India* 1986, 18, 10; *Chem. Abstr.* 1987, 106, 81569 z); a new triterpenoid trisaccharide - acaciaside - isolated from seeds and its structure elucidated (*Phytochemistry* 1989, 28, 207); an acidic polysaccharide isolated from seeds, composed of arabinose, xylose, galactose, glucose and glucuronic acid in molar ratio of 1.5:2.0:2.2:1.0:3.0 respectively (*Carbohydr. Res.* 1989, 185, 105; *Chem. Abstr.* 1989, 110, 189393 j).

NEW COMPOUNDS



Acaciaside

R = Glu[(2→1)Ara](6→1)Glu

A. catechu (L.f.) Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 4).

Seed fatty acids contained 0.1% of C18:1 epoxy acids (*J. Am. Oil Chemists Soc.* 1983, 60, 1893; *Chem. Abstr.* 1984, 100, 3559 h).

A. farnesiana (L.) Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 5).

Glycosidal fraction of extract (2.0 to 10.0 µg) showed increased outflow on perfused isolated guinea pig lung *per se* and also increased outflow after histamine-induced spasm. It showed vasodilator action in hind limb perfusion of dog in same doses by increased femoral

venous outflow. It inhibited carrageenin and formaldehyde-induced inflammation. Thus, glycosidal fraction exhibited smooth muscle relaxant and anti-inflammatory effects (*Indian J. Physiol. Pharmacol.* 1986, 30, 269).

A. latifolia Benth.

Hydrolysis of flower extract yielded quercetin-7-O- β -glucoside, -3-O- β -galactoside, -3-O- β -glucoside, -3-O-rutinoside, -3-O-trioside with glucose and galactose as sugars, myricetin-3-O- β -galactoside and -3-O- β -glucoside, taxifolin-7-O- α -glucoside and isorhamnetin (*J. Nat. Prod.* 1986, 49, 943).

Distribution: Introduced into India in Pondicherry.

A. lenticularis Buch.-Ham. ex Benth.

Kumaon - Khin.

Germacrene D, taraxasteryl acetate, lupeol and its acetate, friedelan-3 β -ol, friedelan-3-one, betulin, stigmasterol and β -sitosterol isolated (*Herba Pol.* 1987, 33, 83; *Chem. Abstr.* 1988, 109, 208273 t).

Distribution : Sub-Himalayan tracts, from Kumaon to Sikkim, alt. 800-1000 m.

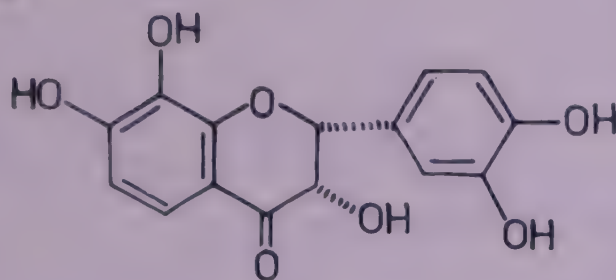
A. leucophloea (Roxb.) Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 6).

A new saponin - betulinic acid-3-O- β -maltoside - isolated from roots and its structure elucidated (*Indian J. Pharm. Sci.* 1985, 47, 154); two new glycosides-1,3-dihydroxy-5-methoxy-2-methylanthraquinone-8-O- α -L-rhamnopyranoside and 1-hydroxy-8-methoxy-2-methylanthraquinone-3-O- α -L-rhamnopyranoside - together with 1,5-dihydroxy-8-methoxy-2-methylanthraquinone-3-O- α -L-rhamnopyranoside and galangin-3-O- α -L-rhamnopyranoside isolated from roots (*J. Nat. Prod.* 1986, 49, 205).

A. melanoxylon R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 6).

A new 2,3-cis-dihydroflavonol - 3,7,8,4',5'-pentahydroxyflavanone (I) - along with its trans isomer isolated from heartwood and characterised (*Chem. Commun.* 1986, 675); two pairs of diastereoisomeric leucoanthocyanidins - (2R,3R,4R)melacacidin, (2R,3R,4S)isomelacacidin, (2R,3R,4R)4-O-ethylmelacacidin and (2R,3R,4S)4-O-ethylisomelacacidin - isolated from heartwood (*Phytochemistry* 1986, 25, 1961); two new dihydroflavonols - (-)-2,3-cis-7,8,3',4'-tetrahydroxydihydroflavonol and 2,3-trans-7,3',4'-trihydroxy-5-methoxydihydroflavonol - together with 2,3-trans-7,8,3',4'-tetrahydroxydihydroflavonol isolated and their stereostructures determined (*Phytochemistry* 1987, 26, 813).

NEW COMPOUNDS



I

A. raddiana Savi syn. *A. tortilis* (Forssk.) Hayne

Hexacosanol, betulin, α - and β -amyrins and β -sitosterol isolated from stem bark; 3-acetyl- β -sitosterol and betulin isolated from heartwood (*J. Indian Chem. Soc.* 1986, 63, 853).

Distribution : Introduced into India in Rajasthan from Israel.

A. tortilis (Forssk.) Hayne; see *A. raddiana* Savi

ACALYPHA (Euphorbiaceae)

A. indica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 8).

Stigmasterol isolated from roots and leaves; acalypchol acetate isolated only from leaves (*Bangladesh J. Sci. Ind. Res.* 1985, 20, 171; *Chem. Abstr.* 1988, 108, 52780 x).

ACANTHOPANAX (Araliaceae)

A. aculeatum (Ait.) Seem.; see *Eleutherococcus trifolius* (L.) Hu

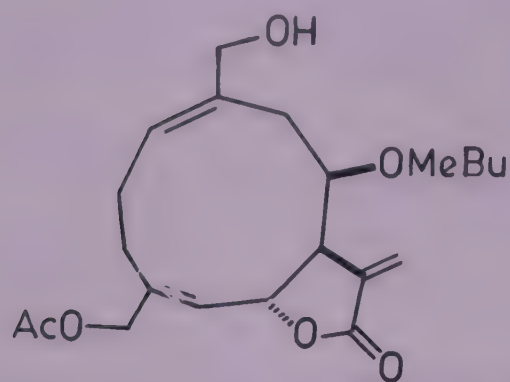
A. trifolius (L.) Merr.; see *Eleutherococcus trifolius* (L.) Hu

ACANTHOSPERMUM (Asteraceae)

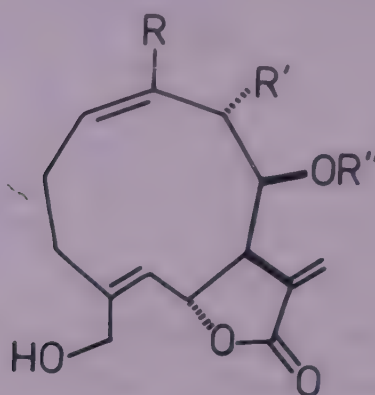
A. hispidum DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 6).

Nevadensin, salvigenin, caffeic acid and acanthospermol galactoside isolated from leaves (*Fitoterapia* 1985, 56, 249); 4(E)acanthospermolide and two 4(Z)acanthospermolide derivatives (I, II) isolated from aerial parts collected in Malawi and their structures determined (*Planta Med.* 1986, 52, 154).

NEW COMPOUNDS



4(E)Acanthospermolide



I

R = CH₂OH, R' = OAc, R'' = Isobutyryl

II

R = CHO, R' = OMe, R'' = 2-MeButyryl

ACANTHUS (Acanthaceae)

A. ilicifolius L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 9).

Benzoxazolin-2-one isolated (*Indian J. Pharm. Sci.* 1984, 46, 218); octacosanol, stigmasterol and its glucoside and benzoxazolin-2-one isolated from roots (*J. Nat. Prod.* 1986, 49, 354); a new flavone glycoside - methyl apigenin-7-O- β -D-glucopyranuronate - isolated from leaves along with apigenin-7-O-glucuronide and its structure elucidated (*J. Indian Chem. Soc.* 1987, 64, 228).

ACER (Aceraceae)

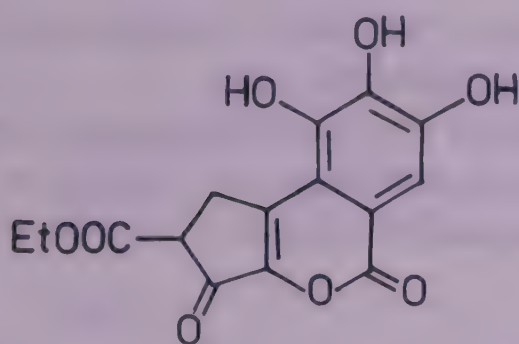
A. oblongum Wall. ex DC.

Garhwal - Kirmola, Phandgao, Pharbanj; Jaunsar - Pangoi, Paranga; Kumaon - Galiya, Parpat, Potai, Putli; Lepcha - Phirphiri; Nainital - Phatgab, Phatgal; P. - Mark, Pangoc.

A new compound - ethyl brevifolin carboxylate - along with (D)3-O-methylchiroinositol, β -amyrin, β -sitosterol, apigenin, kaempferol, ethyl gallate and quercetin isolated and characterised (*Phytochemistry* 1988, 27, 3990).

Distribution : Kashmir to Arunachal Pradesh and Manipur, ascending to 2500 m.

NEW COMPOUNDS



Ethyl brevifolin carboxylate

ACHILLEA (Asteraceae)

A. alpina L.

Succinic, fumaric, aconitic and α -furoic acids isolated (*Zhongyao Tongbao* 1985, 10, 38; *Chem. Abstr.* 1986, 104, 81532 r).

Distribution : Meghalaya and Nepal.

BIOLOGICAL ACTIVITY

Succinic, fumaric, aconitic and α -furoic acids showed significant anti-inflammatory and sedative activities in mice, rats and rabbits; in addition, succinic and fumaric acids showed both antipyretic and analgesic activities whereas aconitic acid showed only antipyretic and α -furoic acid only analgesic activities (*Zhongyao Tongbao* 1985, 10, 38; *Chem. Abstr.* 1986, 104, 81532 r).

ACHYRANTHES (Amaranthaceae)

A. aspera L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 10).

Linoleic (49.4), oleic (22.6), palmitic (18.6), stearic (4.4), behenic (1.8), arachidic (1.6), myristic (1.2) and lauric (0.4%) acids present in seed oil (*Fette Seifen Anstrichm.* 1985, 87, 196; *Chem. Abstr.* 1985, 103, 34909 p).

ACOKANTHERA (Apocynaceae)

A. venenata G. Don

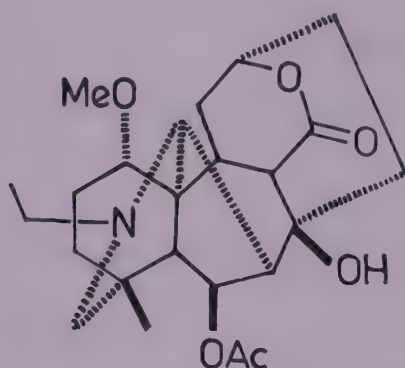
Leaves contained cardiac glycosides (2.2%); a new cardenolide - glucoacovenoside B - along with acovenoside A isolated (*Khim. Pri. Soedin.* 1987, 372; *Chem. Abstr.* 1987, 107, 214821 r).

Distribution : Introduced into Indian gardens.

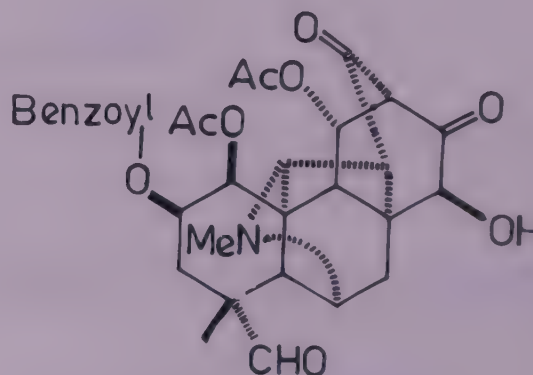
ACONITUM (Ranunculaceae)

A. bisma (Buch.-Ham.) Rap. syn. *A. palmatum* D. Don (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 8).

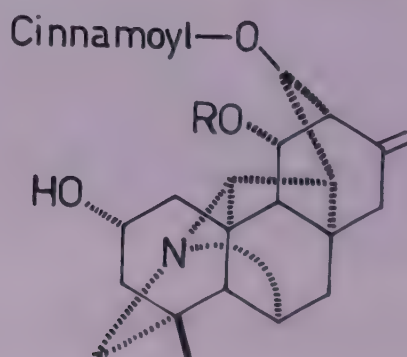
Four new diterpenoid alkaloids - 15-deacetylvakognavine, palmadine, palmatine and 6-acetylheteratisine - isolated along with vakognavine, heteratisine, isoatisine and hetidine; structures of new compounds elucidated (*Tetrahedron Lett.* 1988, 29, 1875).

NEW COMPOUNDS .

6-Acetylheteratisine



15-Deacetylvakognavine



Palmatine

R = H

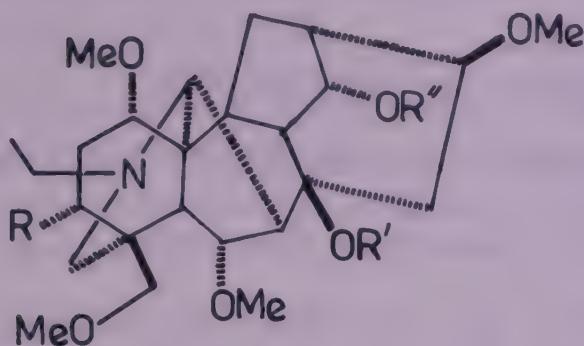
Palmadine

R = Ac

A. falconeri Stapf (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 9).

Two new alkaloids - falconerine and falconerine-8-acetate - isolated from roots and their structures elucidated (*Heterocycles* 1986, 24, 1061); two new diterpenoid alkaloids - falconerine and falconeridine - isolated from roots and their structures determined (*Heterocycles* 1989, 29, 225).

NEW COMPOUNDS



Falconerine

R = OH, R' = H, R'' = Veratryl

Falconerine 8-acetate

R = OH, R' = Ac, R'' = Veratryl

Falconericine

R = H, R' = Ac, R'' = Veratryl

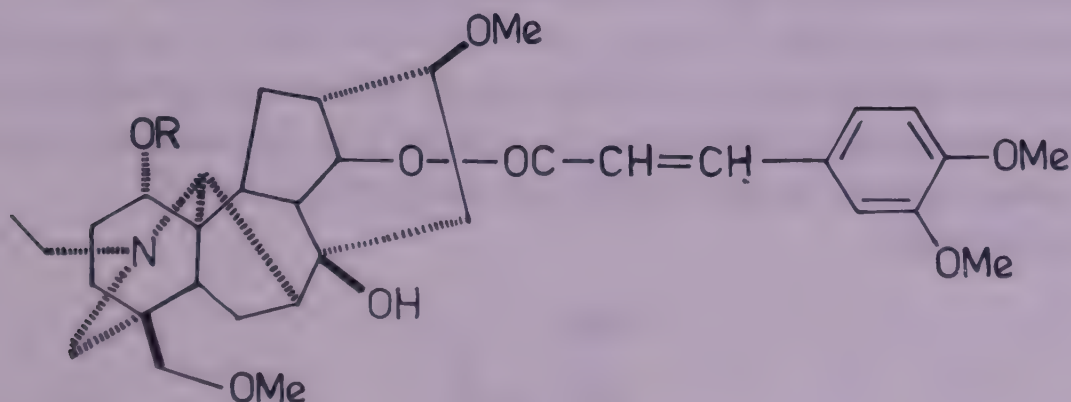
Falconeridine

R = H, R' = H, R'' = Veratryl

A. gymnandrum Maxim. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 10).

Two new alkaloids - gymnaconitine and methylgymnaconitine - isolated along with atisine and tolatisamine and their structures determined (Yaoxue Xuebao 1986, 21, 279; *Chem. Abstr.* 1986, 105, 94502 b).

NEW COMPOUNDS



Gymnaconitine

R = H

Methylgymnaconitine

R = Me

A. heterophyllum Wall. ex Royle (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 10).

Atisine synthesised (*Chem. Commun.* 1987, 1360).

A. napellus L. var. *rotundifolium* (Kar. & Kir.) Hook.f.; see *A. rotundifolium* Kar. & Kir.

A. palmatum D.Don; see *A. bisma* (Buch.-Ham.) Rap.

A. rotundifolium Kar. & Kir. syn. *A. napellus* L. var. *rotundifolium* (Kar. & Kir.) Hook.f.

Isolation and identification of atisine chloride and isoatisine (*Khim. Prir. Soedin.* 1988, 309; *Chem. Abstr.* 1988, 109, 70430 h).

Distribution : North-west Himalayas, alt. 4000-5000 m.

A. spicatum (Bruhl) Stapf (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 11).

Pseudaconitine, liquidambaric acid and 24-ethylcholest-5-en-3 β -ol isolated from roots (*Zhongcaoyao* 1988, 19, 340; *Chem. Abstr.* 1989, 110, 72524 m).

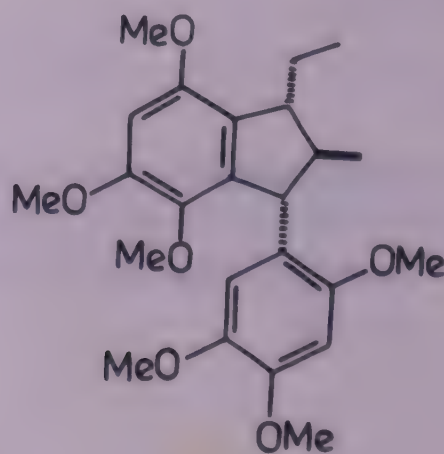
ACORUS (Araceae)

A. calamus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 11).

Root extract exhibited antimicrobial activity against *Staphylococcus aureus*, *Escherichia coli* and *Aspergillus niger* (*Comp. Physiol. Ecol.* 1987, 12, 49; *Chem. Abstr.* 1987, 107, 151207 b).

(Z,Z)4,7-Decadienal isolated from oil and synthesised (*Prog. Essent. Oil Res., Proc. Int. Symp Essent. Oils*, 16th 1986, 215; *Chem. Abstr.* 1987, 106, 72677 f); two new compounds - (Z)3-(2,4,5-trimethoxyphenyl)-2-propenal and 2,3-dihydro-4,5,7-trimethoxy-1-ethyl-2-methyl-3-(2,4,5-trimethoxyphenyl)indene (I) - isolated from rhizomes and their structures elucidated and confirmed by synthesis (*Phytochemistry* 1986, 25, 553).

NEW COMPOUNDS



ACRONYCHIA (Rutaceae)

A. laurifolia Blume; see *A. pedunculata* (L.) Miq.

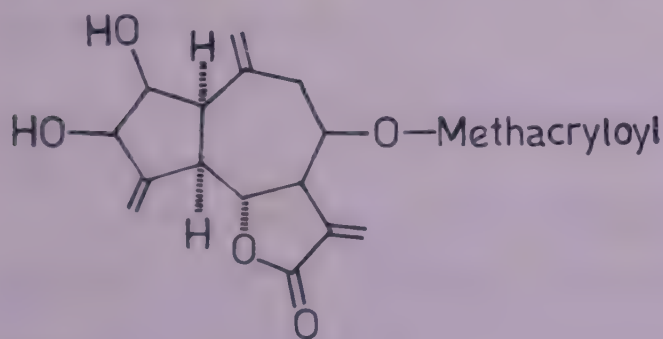
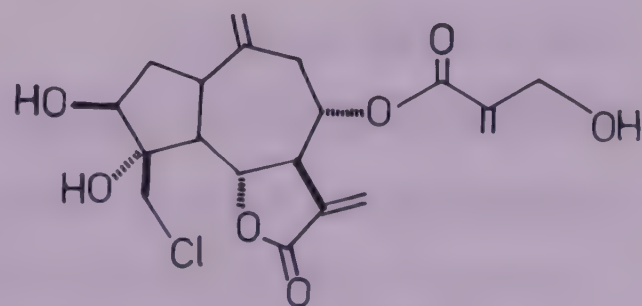
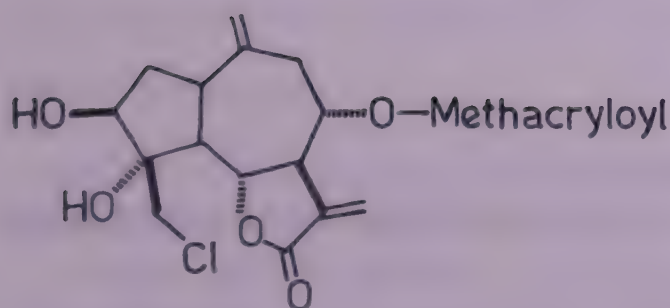
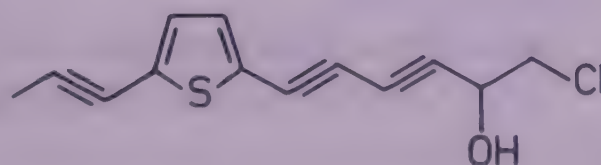
A. pedunculata (L.) Miq. syn. *A. laurifolia* Blume (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 12).

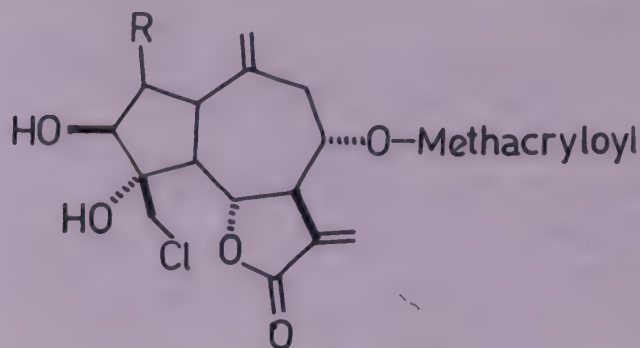
Isolation of acrovestone and bauerenol from bark (*Zhongguo Zhongyao Zazhi* 1989, 14, 94; *Chem. Abstr.* 1989, 110, 189445 c).

ACROPTILON (Asteraceae)

A. repens (L.) DC. syn. *Centaurea picris* Pall. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 13).

A new guaianolide - 2,3-dihydroxy-8-methacryloyloxy-dehydrocostuslactone (I) - isolated from aerial parts and characterised; acrorepiolide, acroptilin, repin, chlorohyssopifolin and janerin also isolated (*Iran. J. Chem. Chem. Eng.* 1984, 4, 65; *Chem. Abstr.* 1985, 103, 193184 q); guaianolides (II, III) and repensolide along with cynaropicrin, janerin and taraxasterol isolated from aerial parts of plant collected from Argentina; a thiophene derivative (IV) also isolated from roots (*Planta Med.* 1986, 52, 399); a new chlorinated sesquiterpene lactone - chlororepdiolide - isolated and its structure and absolute configuration established by X-ray analysis (*J. Nat. Prod.* 1986, 49, 833).

NEW COMPOUND**I****II****III****IV**



Chlororepdiolide

R = α -OH

Repensolide

R = β -OH**ADANSONIA (Bombaceae)**

A. digitata L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 14).

Friedelin, lupeol, bauerenol, β -sitosterol and scopoletin isolated from leaves and bark; betulinic acid isolated from bark and taraxerone and acetates of bauerenol and lupeol also isolated from leaves (*Fitoterapia* 1986, 57, 445); isolation and characterisation of a new flavanone glycoside - 3,3',4'-trihydroxyflavanone-7-O- α -L-rhamnopyranoside - from roots (*Natl. Acad. Sci. Lett.* 1987, 10, 177; *Chem. Abstr.* 1988, 109, 3766 j).

ADENOCAULON (Asteraceae)

A. adhaerescens Maxim.; see *A. himalaicum* Edgew.

A. bicolor Hook.; see *A. himalaicum* Edgew.

A. himalaicum Edgew. syn. *A. bicolor* sensu Hook.f. (non Hook.), *A. adhaerescens* Maxim.

Coumarin, ferulic acid, caffeic acid and caffeoyl-1- β -D-glucopyranoside isolated from roots (*Khim. Prir. Soedin.* 1986, 506; *Chem. Abstr.* 1987, 106, 15743 a).

Distribution : Himalayas, from Himachal Pradesh to Bhutan, alt. 1600-3600 m.

ADHATODA (Acanthaceae)

A. beddomei Clarke

Mal. - Cheria aatalotakam; Tam. - Cinna aatalotai.

Vasicine, vasicinone, deoxyvasicinone, β -sitosterol and its glucoside isolated (*Fitoterapia* 1986, 57, 297).

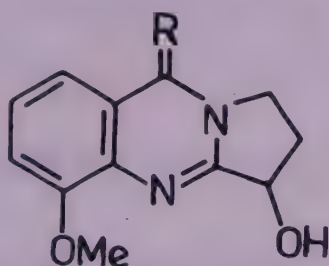
Distribution : Kerala, ascending to 900 m in hills.

A. vasica Nees; see *A. zeylanica* Medik.

A. zeylanica Medik. syn. *A. vasica* Nees (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 15).

A new quinazoline alkaloid isolated from leaves and characterised as 1,2,3,9-tetrahydro-5-methoxypyrrolo[2,1-b]quinazolin-3-ol (I) (*Phytochemistry* 1985, 24, 3080); adhavaasinone isolated and characterised (*Chem. Ind.* 1987, 35); (+)vasicinone isolated from leaves (*J. Indian Chem. Soc.* 1988, 65, 814); synthesis of vasicoline and vasicolinone (*J. Org. Chem.* 1988, 53, 1873).

NEW COMPOUNDS



I

R = H, H

Adhavaasinone

R = O

ADIANTUM (Adiantaceae)

A. capillus-veneris L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 16).

Plant extract showed antiviral activity against vesicular stomatitis virus in monkey cell culture (*Ann. Pharm. Fr.* 1986, 44, 41; *Chem. Abstr.* 1986, 105, 108018 n).

A. caudatum L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 15).

Steroids, triterpenoids and flavonoids found in plant (*Proc. Natl. Acad. Sci. India* 1986, 56B, 244; *Chem. Abstr.* 1987, 107, 151199 a).

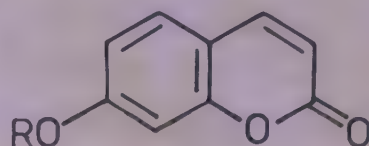
ADINA (Rubiaceae)

A. cordifolia (Willd. ex Roxb.) Benth. & Hook.f. ex Brandis (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 16).

A new coumarin glycoside - adicardin - isolated from root bark and characterised (*Fitoterapia* 1986, 57, 231); quercetin-3,4'-dimethoxy-8-C-rhamnoside, acacetin-5-methoxy-8-C-rhamnoside and genkwanin-8-C-rhamnoside isolated from heartwood (*Curr. Sci.* 1986, 55,

1069); n-heneicosane, n-tricosane, n-pentacosane, n-heptacosane, n-nonacosane, n-hentriacontane, n-tritriacontane, n-pentatriacontane and β -sitosterol isolated from heartwood (*Himalayan Chem. Pharm. Bull.* 1986, 3, 26; *Chem. Abstr.* 1987, 106, 192790 j).

NEW COMPOUNDS



Adicardin

R = Glu(6 \rightarrow 1)Apiose

ADONIS (Ranunculaceae)

A. aestivalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 17).

Astaxanthin diester isolated from flowers (*Comp. Biochem. Physiol. B Comp. Biochem.* 1987, 86, 587; *Chem. Abstr.* 1987, 107, 4306 e).

AEGINETIA (Orobanchaceae)

A. indica L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 16).

BIOLOGICAL ACTIVITY

Polyene compound E and β -sitosterol showed antihepatotoxic activity against both carbon tetrachloride and galactosamine-induced toxicities in primary cultured rat hepatocytes. β -Carotene, retinol and etretinate also exhibited some antihepatotoxic activity (*Shoyakugaku Zasshi* 1984, 38, 198; *Chem. Abstr.* 1985, 102, 56093 z).

AEGLE (Rutaceae)

A. marmelos (L.) Correa (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 17).

Aqueous and alcoholic extracts of leaves (0.5 g/kg) given orally produced significant hypoglycaemia in normal fasted rabbits, but not petroleum ether extract. Aqueous extract showed cardiac stimulant, smooth muscle relaxant and uterine stimulant properties. Alcoholic extract showed cardiac depressant, smooth muscle relaxant and uterine relaxant properties. Daily administration of both extracts for six weeks caused necrosis and congestion of liver and kidney; symptoms were more pronounced with aqueous extract (*Indian J. Pharmacol.* 1988, 20, 80).

Umbelliferone, dictamnine, xanthotoxol, xanthotoxin, scoparone, isopimpinellin,

isoimperatorin, N-2-methoxy-2-(4-methoxyphenyl)ethylcinnamamide, marmeline and its methyl ether, bergapten, marmesin, osthol and auraptin isolated from fruit pericarp and identified by HPLC and GC-MS (*Pharmazie* 1985, 40, 503; *Chem. Abstr.* 1985, 103, 175468 f); synthesis of marmin (*Tetrahedron Lett.* 1987, 28, 2579); β -phellandrene (37.97), α -phellandrene (27.49), α -pinene (7.73), menthol (5.67), p-cymene (3.44), myrcene (3.39), δ -elemene (2.41) and car-3-ene (2.23%) identified by GC-MS in essential oil from leaves of Egyptian plant (*Bull. Fac. Pharm.* 1987, 25, 101; *Chem. Abstr.* 1988, 109, 79565 p).

BIOLOGICAL ACIVITY

Skimmianine inhibited spontaneous motor activity, exploratory behaviour, cataleptogenic activity, conditioned avoidance response and long-term isolation-induced fighting of animals. Mild antimethamphetamine activity was also observed. Its neuroleptic activity was less than that of chlorpromazine (*Arch. Int. Pharmacodyn. Ther.* 1986, 281, 35; *Chem. Abstr.* 1986, 105, 72545 r).

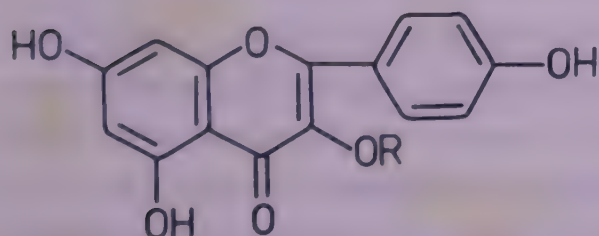
AERVA (Amaranthaceae)^c

A. lanata Juss. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 18).

Plant extract (10.0 g) induced diuresis in (70.0%) of human subjects. Their urine output was significantly elevated ($P < 0.001$) than in controls who received the same quantities of water, 0.9% saline or extract of *Coriandrum sativum* seeds. Flowers were found to be the most effective in inducing diuresis compared to other parts of plant (*Indian J. Physiol. Pharmacol.* 1986, 30, 91).

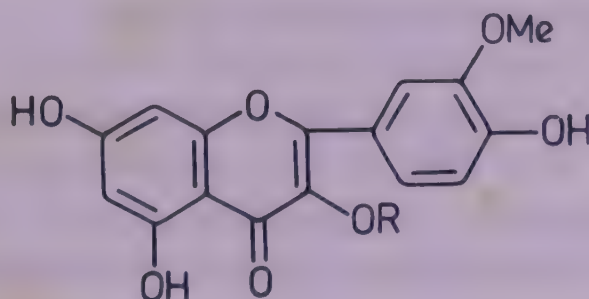
Four flavonoid glycosides (I, II, III and IV) isolated and characterised (*Khim.-Farm. Zh.* 1986, 20, 855; *Chem. Abstr.* 1987, 107, 151179 u); β -sitosterol, campesterol and chrysin isolated from Egyptian plant (*Fitoterapia* 1987, 58, 367); flowering and fruiting parts contained hemicellulose, starch, an acid-soluble polysaccharide and water-soluble polysaccharides; monosaccharide contents of polysaccharides determined (*Khim. Priir. Soedin.* 1989, 425; *Chem. Abstr.* 1989, 111, 74847 p).

NEW COMPOUNDS



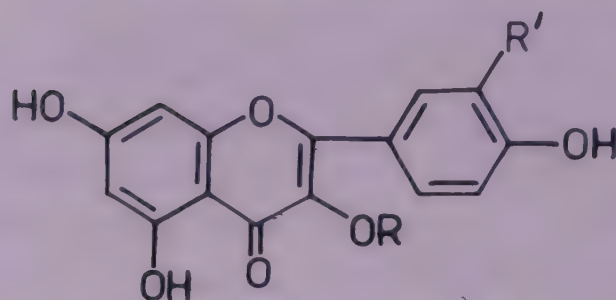
I

R = Glu(6''-p-coumaroyl)



II

R = Glu(6''-p-coumaroyl)



III

R = Glu(4'',6''-di-p-coumaroyl), R' = H

IV

R = Glu(4'',6''-di-p-coumaroyl), R' = OMe

AESCULUS (Hippocastanaceae)

A. hippocastanum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 19).

Two major constituents - butyrospermol and 5α -tirucalla-8,23-dien- 3β -ol - along with taraxerol, α -amyrin, β -amyrin and parkeol identified in seed oil (*Phytochemistry* 1985, 24, 119); analysis of seeds of Yugoslavian plant gave oil (6.10), moisture (6.75) and ash (1.94%); oleic (55.41), linoleic (23.60), eicosenoic (4.9) and erucic (1.29%) acids identified in nonsaponifiable fraction (3.95%) obtained from oil (*Arch. Farm.* 1986, 36, 295; *Chem. Abstr.* 1987, 106, 99440 k); esculetin synthesised (*Arch. Pharmacol Res.* 1986, 9, 115; *Chem. Abstr.* 1987, 106, 113124 u).

BIOLOGICAL ACTIVITY

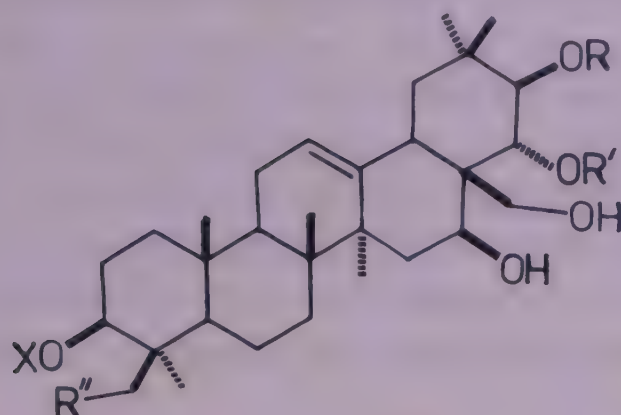
Esculetin exhibited cytotoxic activity (ED₅₀ 4.3 μ g/ml) against L1210 cells (*Arch. Pharmacol Res.* 1986, 9, 115; *Chem. Abstr.* 1987, 106, 113124 u).

A. indica Colebr. ex Camb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 19).

Seed oil exhibited antiseptic activity against human pathogenic bacteria and phytopathogenic fungi (*Fitoterapia* 1988, 59, 129).

A new triterpene glycoside - aesculuside A - isolated from seeds and its structure elucidated (*Planta Med.* 1986, 52, 409); isolation and structure determination of aesculuside B (*J. Nat. Prod.* 1987, 50, 781); acid hydrolysis of seed saponins yielded 21,22-diangeloylbarringtogenol C, 21-angeloylbarringtogenol C and 22-angeloyl R1-barrigenol while alkaline hydrolysis yielded barringtogenol C, aescigenin and protoaescigenin (*Pharmazie* 1987, 42, 141; *Chem. Abstr.* 1987, 107, 12737 m); a new molluscicidal triterpene glycoside (I) isolated and its structure elucidated (*Int. J. Crude Drug Res.* 1987, 25, 158); ethyl octadecenoate, methyl octadecenoate, ethyl heptadecanoate and methyl heptadecanoate isolated from seeds (*J. Nat. Prod.* 1989, 52, 180).

NEW COMPOUNDS



X = Gluc.acid[(2→1)Glu](4→1)Glu

Aesculuside A

R = Angeloyl, R' = H, R'' = OH

Aesculuside B

R,R' = H, R'' = OH

I

R,R' = Angeloyl, R'' = H

AGANOSMA (Apocynaceae)

A. caryophyllata (Roxb. ex Sims) G.Don; see *A. dichotoma* (Roth) K. Schum.

A. dichotoma (Roth) K. Schum. syn. *A. caryophyllata* (Roxb. ex Sims) G.Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 8).

Ursolic, vanillic and ferulic acids, rutin, hyperin, isoquercetin, quercetin-3-arabinoside and β -sitosterol isolated from flowers (*Fitoterapia* 1985, 56, 174); kaempferol, quercetin and their 3-arabinosides, ferulic acid and β -sitosterol isolated from leaves (*Indian J. Pharm. Sci.* 1985, 47, 165).

AGAVE (Agavaceae)

A. americana L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 19).

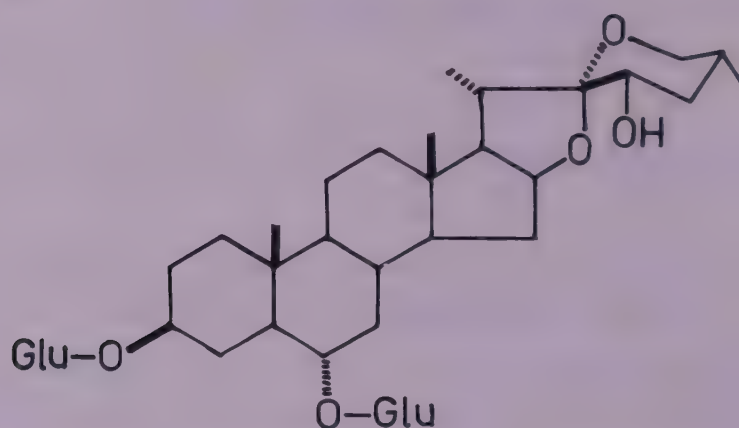
Hecogenin, tigogenin and gitogenin isolated from leaves and roots (*Anal. Chem. Sym. Ser.* 1985, 23, 93; *Chem. Abstr.* 1986, 104, 165367 d).

A. cantala (Haw.) Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 19).

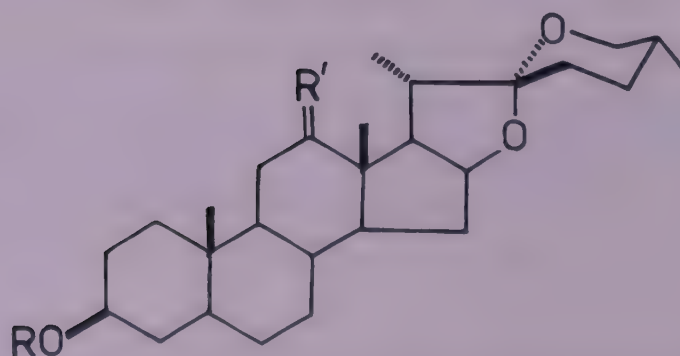
Saponin fraction inhibited significantly growth of JTC-26 cells (originating from human cervical carcinoma) *in vitro* (*Pharmazie* 1985, 40, 586; *Chem. Abstr.* 1986, 104, 28519 r).

A new spirostanol bisdesmoside - cantalasaponin 1 - isolated from rhizomes and its structure elaborated (*J. Nat. Prod.* 1985, 48, 395); two spirostanol glycosides - cantalasaponins 2 and 4 - isolated from rhizomes and characterised (*Phytochemistry* 1986, 25, 1491); cantalasaponin 3 isolated from rhizomes and its structure determined (*Phytochemistry* 1986, 25, 2895); cantalasaponins 6,7 and 8 isolated from leaves and partially characterised (*Int. J. Crude Drug Res.* 1987, 25, 35); a new tigogenin pentaglycoside isolated from fruits and characterised as 3-O- $[\beta$ -D-xylopyranosyl(1 \rightarrow 2)- β -D-galactopyranosyl(1 \rightarrow 2)- β -D-xylopyranosyl(1 \rightarrow 4)- β -D-glucopyranosyl(1 \rightarrow 3)- β -D-glucopyranosyl]-25(R)-5 α -spirostan-3 β -ol (*J. Nat. Prod.* 1987, 50, 263).

NEW COMPOUNDS



Cantalasaponin 1



Cantalasaponin 2

R = Gal[(2 \rightarrow 1)Glu(3 \rightarrow 1)Glu](4 \rightarrow 1)Xyl, R' = O

Cantalasaponin 3

R = Gal[(2 \rightarrow 1)Glu(3 \rightarrow 1)Glu](4 \rightarrow 1)Xyl, R' = H,H

Cantalasaponin 4

R = Gal[(2 \rightarrow 1)Glu(3 \rightarrow 1)Glu(4 \rightarrow 1)Xyl](4 \rightarrow 1)Xyl, R' = O

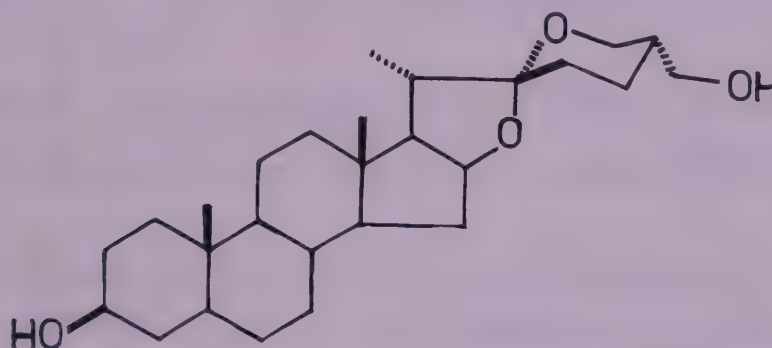
BIOLOGICAL ACTIVITY

Cantalasaponin 2 was lethal to snail, *Biomphalaria glabrata*, at a concentration of 7 ppm (*Phytochemistry* 1986, 25, 1491); cantalasaponin 7 showed weak molluscicidal activity against *Biomphalaria glabrata* at a concentration of 50 ppm in 24 hr (*Int. J. Crude Drug Res.* 1987, 25, 35).

A. sisalana Perr. ex Engelm. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 20).

Isolation of hecogenin from leaves (*Indian Drugs* 1985, 22, 129); tigogenin, gitogenin and hecogenin isolated from leaves, seeds, flowers and roots of Nigerian plant (*Anal. Chem. Symp. Ser.* 1985, 23, 93; *Chem. Abstr.* 1986, 104, 165367 d); acid hydrolysis of juice of leaves yielded a new steroidal sapogenin - barbourgenin - whose structure established; rockogenin and chlorogenin also isolated (*J. Nat. Prod.* 1986, 49, 687).

NEW COMPOUNDS



Barbourgenin

A. vera-cruz Mill. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 20).

Hecogenin isolated from leaves (*Indian Drugs* 1985, 22, 129).

AGERATINA (Asteraceae)

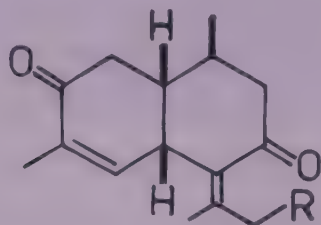
A. adenophora (Spreng.) King & Robinson syn. *Eupatorium adenophorum* Spreng. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 20).

Ethanollic extract of aerial parts (1.0 g/kg, i.p.) was toxic to mice and increased spontaneous motor activity (*Herba Pol.* 1983, 29, 93; *Chem. Abstr.* 1985, 102, 3227 q).

Isohexacosane, n-hexacosanoic acid, β -amyrin, stigmasterol, lupeol, taraxasterol, salvi-genin and epifriedelinol isolated from aerial parts (*Herba Pol.* 1983, 29, 93; *Chem. Abstr.* 1985, 102, 3227 q); five new cadinene derivatives - 9-oxo-10,11-dehydroageraphorone, 9-oxo-12-hydroxy-10,11-dehydroageraphorone, 9-oxoageraphorone, 9 β -hydroxyageraphorone and I - along with β -farnesene, germacrene D, bisabolene and caryophyllene isolated from aerial parts and structures of new compounds determined (*Phytochemistry* 1981, 20, 1432); absolute configuration at C-9 in 9 β -hydroxyageraphorone established as R (*Tetrahedron Lett.* 1985, 26, 509); friedelin, taraxasterol, stigmastadienone and stigmasterol isolated (*Rev. Latinoam. Quim.* 1987, 18, 51; *Chem. Abstr.* 1987, 106, 192805 t); n-dotriacontane, β -sitosterol, stigmasterol, taraxasteryl palmitate and taraxasteryl acetate isolated from leaves and inflorescence

(Yunnan Zhiwu Yanjiu 1988, 10, 238; *Chem. Abstr.* 1988, 109, 167322 n); a new sesquiterpene - eupatorenone - isolated and its structure elucidated (*J. Org. Chem.* 1989, 54, 2253).

NEW COMPOUNDS

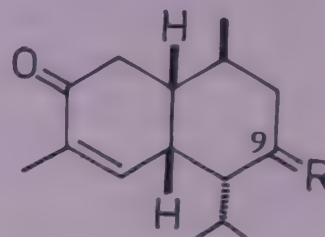


9-Oxo-10,11-dehydroageraphorone

R = H

9-Oxo-10,11-dehydro-12-hydroxyageraphorone

R = OH

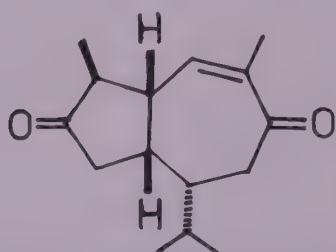


9-Oxoageraphorone

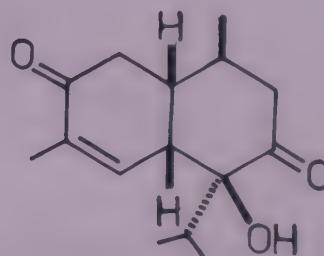
R = O

9 β -Hydroxyageraphorone

R = α -H, β -OH



Eupatorenone



I

BIOLOGICAL ACTIVITY

9 β -Hydroxyageraphorone exhibited appreciable antifeedant action against *Philasomia ricini* (*Tetrahedron Lett.* 1985, 26, 509).

AGERATUM (Asteraceae)

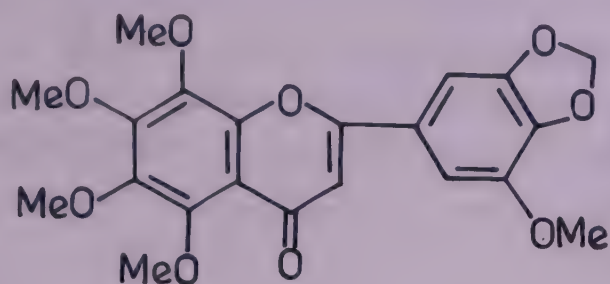
A. conyzoides L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 21).

Plant extract produced hypotensive response in dog which was not blocked by pretreatment of animals with propranolol, anthisan or atropine. It showed negative inotropic and chronotropic effects on perfused heart of frog at dose of 10.0-40.0 mg. It also showed direct acting vasodilation response on blood vessels of rat and relaxant action on isolated smooth muscle similar to that of papaverine (*J. Res. Ayurveda & Siddha* 1981, 2, 242).

Structure of conyzorigun revised and shown to be identical to that of eupalestin (*J. Chem. Soc. Perkin 1* 1984, 2945); three new flavones - ageconylflavones A, B and C - isolated and characterised as 5,6,7-trimethoxy-3',4'-methylenedioxyflavone, 5,6,7,3'-tetramethoxy-4'-hydroxyflavone and 5,6,7,3',5'-pentamethoxy-4'-hydroxyflavone respectively; linderoflavone B, eupalestin, nobiletin, 5'-methoxynobiletin, sinensetin, 5,6,7,3',4',5'-hexamethoxyflavone, 5,6,7,8,3'-pentamethoxy-4'-hydroxyflavone and 5,6,7,8,3',5'-hexamethoxy-4'-hydroxyflavone

also isolated (*Phytochemistry* 1986, 25, 2625); β -sitosterol, stigmasterol, spinasterol, dihydrospinasterol, brassicasterol and dihydrobrassicasterol isolated (*Herba Hung.* 1989, 28, 71; *Chem. Abstr.* 1989, 111, 228971 p).

NEW COMPOUNDS

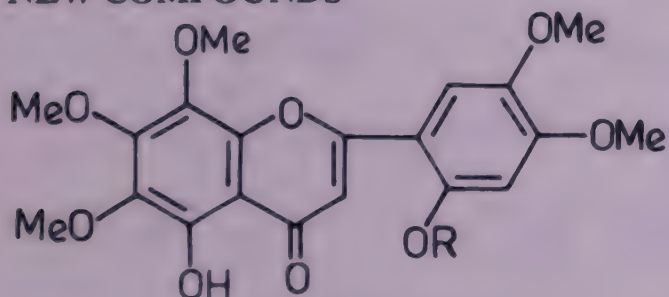


Conyzorigun

A. houstonianum Mill. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 21).

Two new flavones - agehoustin C and agehoustin D - isolated from aerial parts and their structures established as 3'-hydroxy-5,6,7,8,2',4',5'-heptamethoxyflavone and 5,3'-dihydroxy-6,7,8,2',4',5'-hexamethoxyflavone respectively (*Phytochemistry* 1985, 24, 1085); agehoustin C and agehoustin D synthesised (*J. Chem. Res. Synop.* 1987, 278; *Chem. Abstr.* 1988, 108, 186358 z); three new flavones - agehoustins E, F and G - isolated from aerial parts and characterised; 5,6,7,3',4',5'-hexamethoxyflavone also isolated (*Phytochemistry* 1987, 26, 2075); isolation and structure elucidation of ageratone (*Acta Chem. Scand.* 1970, 24, 721); structure of ageratone revised; four new benzofurans - 6-acetyl-5-hydroxy-2-isopropenylbenzo [b]furan (I), 6-acetyl-5-hydroxy-2-(1-hydroxymethylvinyl)benzo[b]furan (II), 1,4-bis-acetoxymethyl-7-acetyl-4-[2'-(6'-acetyl-5'-hydroxy)benzo[b]furanyl]-6,7-dihydroxy-1,2,3,4-tetrahydro-dibenzo[b,d]furan(III) and 4-acetoxymethyl-7-acetyl-4[2'-(6'-acetyl-5'-hydroxy)benzo[b]furanyl]-6-hydroxy-1-methylene-1,2,3,4-tetrahydrodibenzo[b,d]furan (IV) - isolated from roots along with ageratone and their structures elucidated (*Phytochemistry* 1987, 26, 3055); a new benzofuran (V) isolated from roots and characterised (*Phytochemistry* 1988, 27, 3996).

NEW COMPOUNDS

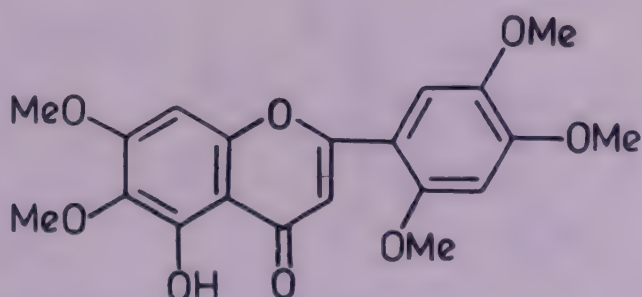


Agehoustin E

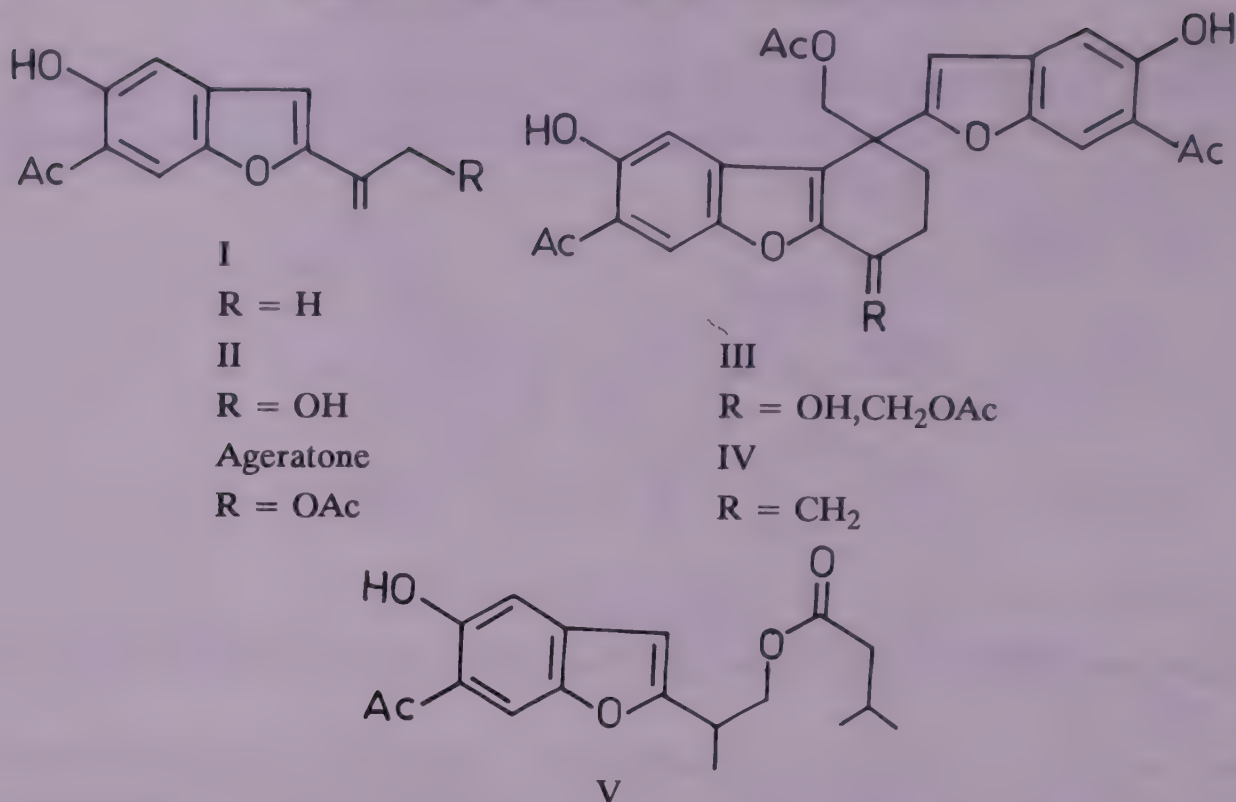
R = Me

Agehoustin F

R = H



Agehoustin G

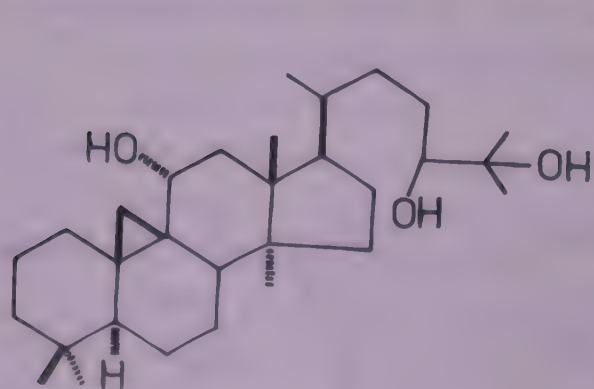


AGLAIA (Meliaceae)

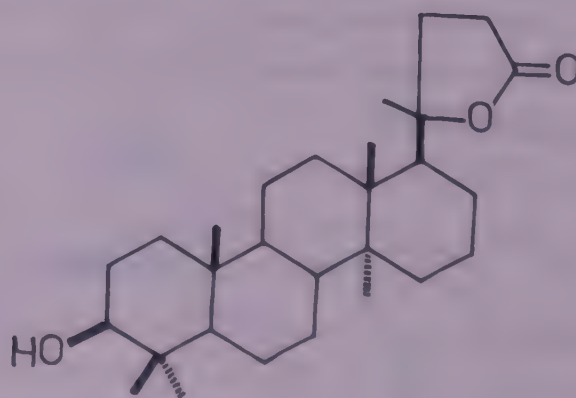
A. anamallayana (Bedd.) Kosterm. syn. *Lansium anamallayanum* Bedd. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 23).

Lansitriol isolated and its structure established (*Indian Drugs* 1987, 24, 383; *Can. J. Chem.* 1987, 65, 150); three new steroids - lansisterone E, lansisterone Z and lansisterol A - isolated from leaves and characterised as 3 β ,4 β -dihydroxy-17(20)-cis-5 α -pregnan-16-one, 3 β ,4 β -dihydroxy-17(20)-trans-5 α -pregnan-16-one and 24-methylene-3 β ,4 β ,7 β ,20-tetrahydroxycholest-5-ene respectively; lansisterol B also isolated; a new triterpene lactone - lansilactone - isolated from bark and characterised (*Can. J. Chem.* 1987, 65, 150).

NEW COMPOUNDS



Lansitriol

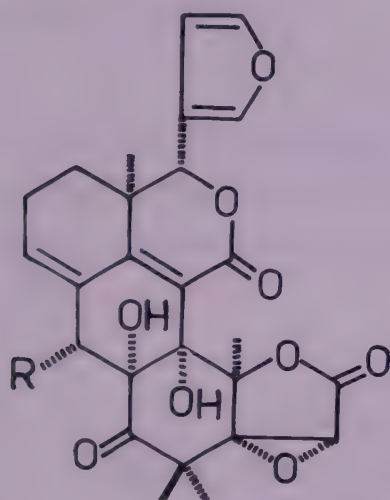


Lansilactone

A. domestica (Correa emend. Jack) Pellegrin syn. *Lansium domesticum* Jack (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 22).

Three new tetranortriterpenoids - dukunolides A, B and C - isolated from seeds and their structures and absolute configuration determined by X-ray analysis (*J. Org. Chem.* 1985, 50, 5487; *Chem. Commun.* 1985, 395; *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 505; *Chem. Abstr.* 1986, 104, 165311 f); dukunolides D and E isolated from seeds and their structures elucidated and confirmed by X-ray analysis (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 505; *Chem. Abstr.* 1986, 104, 165311 f; *Phytochemistry* 1988, 27, 237); dukunolide F isolated and its crystal structure determined (*Phytochemistry* 1988, 27, 237); cis-cisoid-cis isomer (I) of 3-oxo- α -bourbonene isolated and its structure determined and confirmed by synthesis (*Bull. Chem. Soc. Jpn.* 1988, 61, 2672).

NEW COMPOUNDS

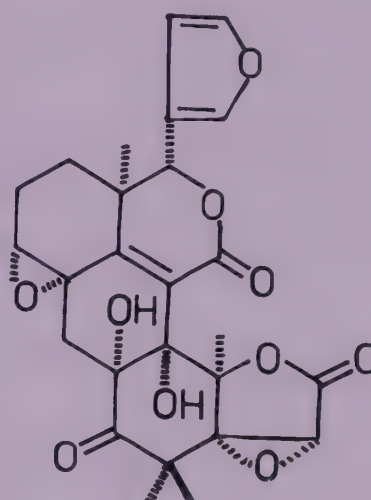


Dukunolide A

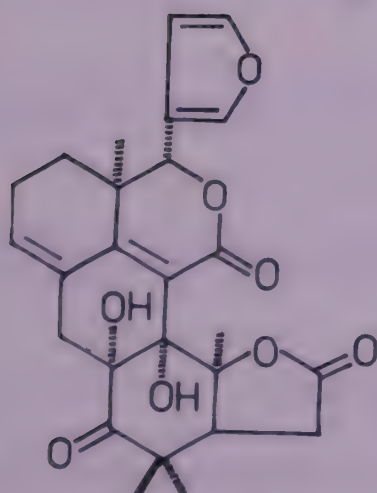
R = H

Dukunolide C

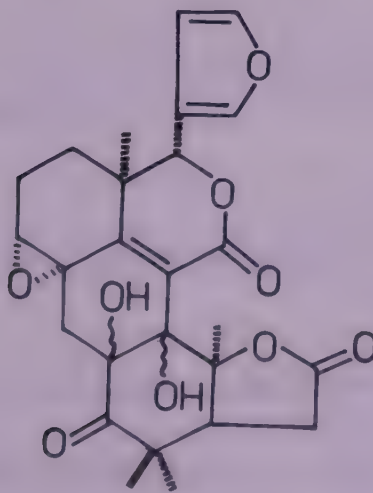
R = OAc



Dukunolide B



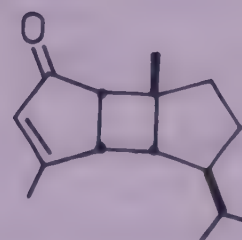
Dukunolide D



Dukunolide E

~ = α

Dukunolide F

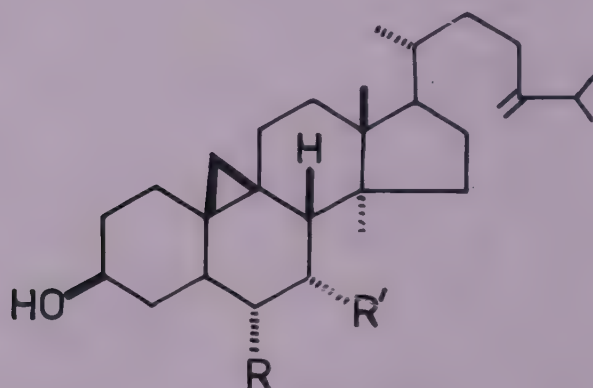
~ = β 

I

A. elaeagnoidea (Juss.) Benth. syn. *A. roxburghiana* (W. & A.) Miq. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 22).

Two new triterpenes - roxburghiadiols A and B - isolated from leaves and fruits and their structures elucidated (*Indian Drugs* 1986, 23, 260); isolation of two new triterpenes and their characterisation as 29-norcycloartan-24,25-epoxy-3 β -ol and 29-norcycloartan-23-ene-3 β ,25-diol from aerial parts; 29-norcycloartenol and 28,29-bisnorcycloartan-24-methylene-3 β ,6 α -diol also isolated (*Planta Med.* 1988, 54, 40).

NEW COMPOUNDS



Roxburghiadiol A

R = H, R' = OH

Roxburghiadiol B

R = OH, R' = H

A. elaeagnoidea (Juss.) Benth. var. *beddomei* (Gamble) Nair syn. *A. roxburghiana* (W. & A.) Miq. var. *beddomei* Gamble

Tel. - Yerra aduga; Tam. - Chokkala; Mal. - Punyava.

(+) Odorinol isolated (*Planta Med.* 1987, 53, 254).

Distribution : Eastern Ghats from Ganjam to Godavari and hills of Deccan Peninsula upto 900 m.

BIOLOGICAL ACTIVITY

Odorinol exhibited strong antiviral activity against Ranikhet disease virus in chick embryo (*Planta Med.* 1987, 53, 254).

A. roxburghiana (W. & A.) Miq.; see *A. elaeagnoidea* (Juss.) Benth.

A. roxburghiana (W. & A.) Miq. var. *beddomei* Gamble; see *A. elaeagnoidea* (Juss.) Benth. var. *beddomei* (Gamble) Nair

AGROPYRON (Poaceae)*A. repens* (L.) Beauv.

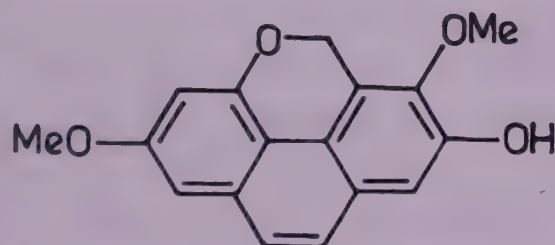
Eng. - Couch grass, Dog grass.

5-Hydroxyindole-3-acetic acid and 5-hydroxytryptophan isolated (*J. Agric. Food Chem.* 1989, 37, 1143; *Chem. Abstr.* 1989, 111, 54184 s).

Distribution: Native to Europe, now a weed in Kashmir alt. 2400-4200 m.

BIOLOGICAL ACTIVITY5-Hydroxyindole-3-acetic acid and 5-hydroxytryptophan inhibited growth of other plants (*J. Agric. Food Chem.* 1989, 37, 1143; *Chem. Abstr.* 1989, 111, 54184 s).**AGROSTOPHYLLUM (Orchidaceae)***A. khasianum* Griff.Agrostophyllin isolated and its structure elucidated as 2,6-dimethoxy-7-hydroxy-5H-phenanthro[4,5-bcd]pyran (*Phytochemistry* 1988, 27, 1899).

Distribution: Meghalaya and Manipur, alt. 100-1000 m.

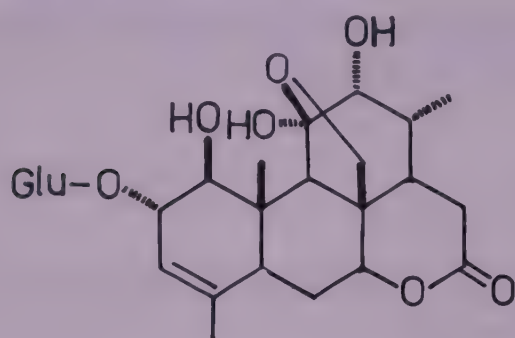
NEW COMPOUNDS

Agrostophyllin

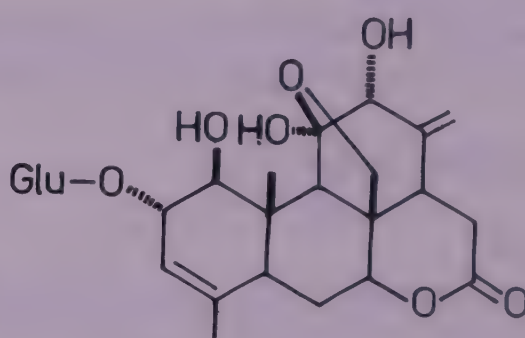
AILANTHUS (Simaroubaceae)*A. altissima* (Mill.) Swingle syn. *A. glandulosa* Desf. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 24).Chloroform extract of plant showed antimalarial activity *in vitro* (IC₅₀ 5.0 µg/ml) against *Plasmodium falciparum* and *in vivo* (ED₅₀ 82.94 µg/ml/day) against *P. berghei* in mice (*Phytother. Res.* 1987, 1, 22; *Chem. Abstr.* 1987, 107, 211491 b).Shinjulactones B, D and E isolated (*Bull. Chem. Soc. Jpn.* 1984, 57, 2484); four new shinjuglycosides A, B, C and D isolated from seeds and their structures elucidated (*Bull. Chem. Soc. Jpn.* 1984, 57, 2496); three new quassinoids - shinjulactones I, J and K - along with shinjulactone F isolated and characterised (*Bull. Chem. Soc. Jpn.* 1984, 57, 2885); conversion of ailanthone into shinjulactone C (*Bull. Chem. Soc. Jpn.* 1985, 58, 2357); shinjulactone L isolated and its structure determined (*Bull. Chem. Soc. Jpn.* 1985, 58, 2723); bound lipids, mainly monogalactosyldiacylglycerol, and oleic, palmitic and linoleic acids in free state

identified in glandular trichomes secretion (*Phytochemistry* 1985, 24, 1599); isolation and structure elucidation of shinjulactones M and N from root bark (*Bull. Chem. Soc. Jpn.* 1986, 59, 1638); two new quassinoid glycosides - shinjuglycosides E and F - isolated from root bark and their structures established (*Chem. Pharm. Bull.* 1987, 35, 4302); isolation of a new indole alkaloid - 1-methoxycarbonyl-4,8-dimethoxy- β -carboline (I) - from leaves along with 1-methoxycarbonyl- β -carboline and its structure elucidation (*Planta Med.* 1989, 55, 286).

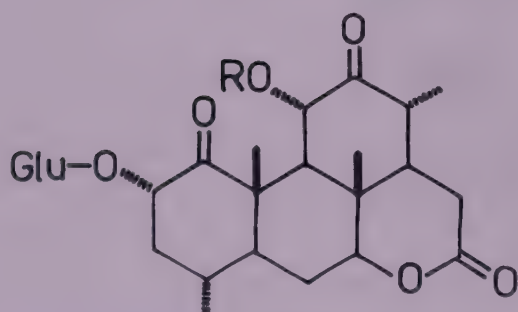
NEW COMPOUNDS



Shinjuglycoside A



Shinjuglycoside B

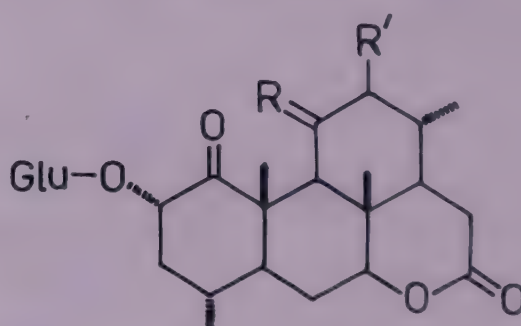


Shinjuglycoside C

R = Ac

Shinjuglycoside D

R = H

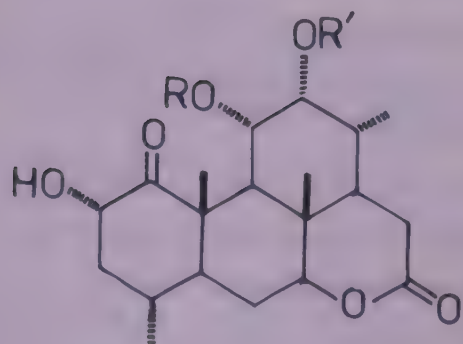


Shinjuglycoside E

R = α -OH, H, R' = α -OH

Shinjuglycoside F

R = O, R' = β -OH

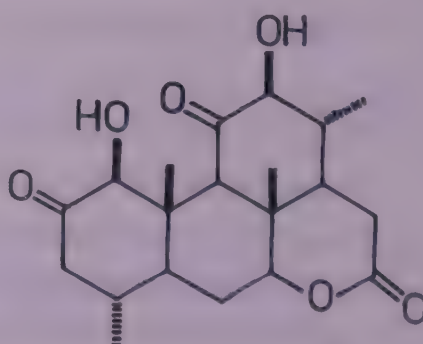


Shinjulactone I

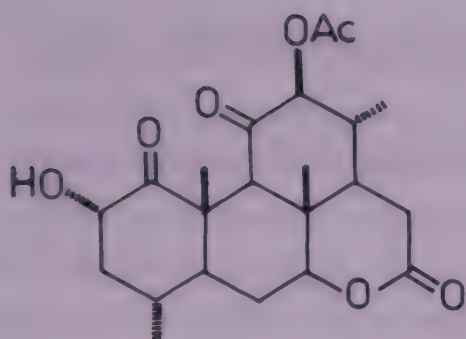
R = Ac, R' = H

Shinjulactone K

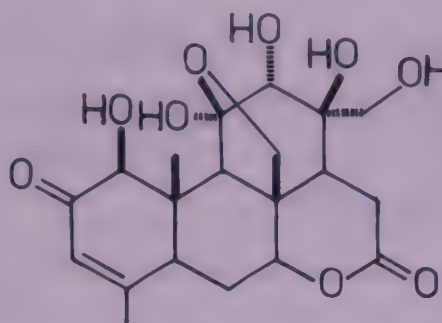
R = H, R' = Ac



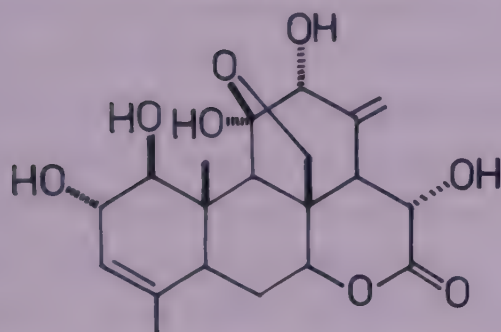
Shinjulactone J



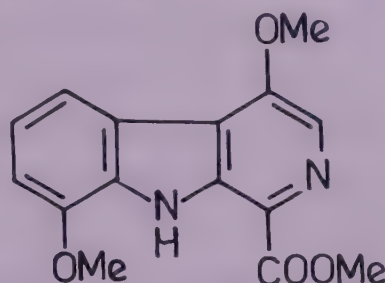
Shinjulactone L



Shinjulactone M



Shinjulactone N



I

BIOLOGICAL ACTIVITY

β -Carboline-1-propionic acid increased rate of blood flow in intestine and stomach (*Shoyakugaku Zasshi* 1985, 39, 28; *Chem. Abstr.* 1985, 103, 206469 p); aianthone showed antimalarial activity *in vitro* (IC₅₀ 0.015 μ g/ml) and *in vivo* (ED₅₀ 0.76 mg/kg/day). Canthin-6-one and 1-methoxycanthin-6-one were inactive *in vitro*. Ailanthinone, chaparrin, glaucarubol, glaucarubin and glaucarubinone also showed antimalarial activity *in vitro* and *in vivo* (*Phytother. Res.* 1987, 1, 22; *Chem. Absir.* 1987, 107, 211491 b).

A. excelsa Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 26).

Excelsin isolated from root bark and its ¹³C-NMR spectrum studied (*J. Indian Chem. Soc.* 1985, 62, 75); 13,18-dehydroexcelsin isolated from roots (*Indian Drugs* 1985, 22, 395).

A. glandulosa Desf.; see *A. altissima* (Mill.) Swingle

A. grandis Prain; see *A. integrifolia* Lamk. ssp. *calycina* (Pierre) Nooteboom

A. integrifolia Lamk. ssp. *calycina* (Pierre) Nooteboom syn. *A. grandis* Prain
Assam - Borpat; Khasi - Diang-chao.

β -Sitosterol, lupeol, α -amyrin and betulinic acid isolated from bark (*J. Indian Chem. Soc.* 1985, 62, 711).

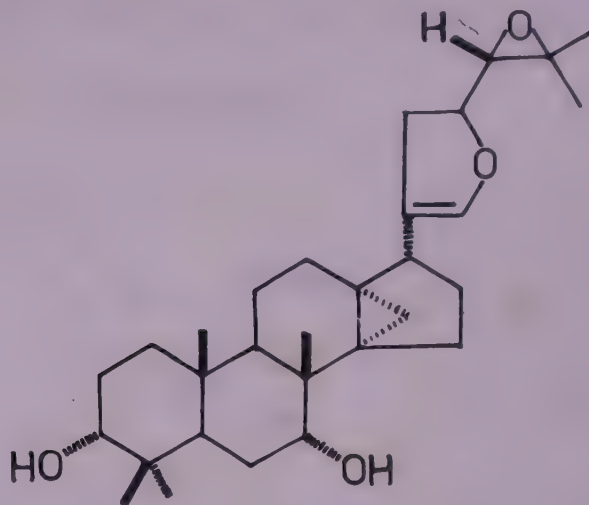
Distribution : North Bengal and Sikkim eastward, ascending upto 1000 m.

A. malabarica DC.; see *A. triphysa* (Dennst.) Alston

A. triphysa (Dennst.) Alston syn. *A. malabarica* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 26).

A new triterpenoid - ailanthol - isolated and its structure established by X-ray studies (*Tetrahedron Lett.* 1985, 26, 1273).

NEW COMPOUNDS



Ailanthol

AJUGA (Lamiaceae)

A. bracteosa Wall. ex Benth. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 19).

A new compound - triacontanyl docosanoate - isolated from aerial parts and characterised; hexacosanol, β -sitosterol and its glucoside and tetracosanoic acid also isolated (*Indian J. Pharm. Sci.* 1987, 49, 225).

A. macrosperma Wall. ex Benth.

Proline (67.9), hydroxyproline (42.8), methionine (23.8), tyrosine (18.4), phenylalanine (9.2), valine (9.2), glutamic acid (2.3), aspartic acid (1.3) and glycine ($13.0 \mu\text{g/g}$ of whole plant) determined colorimetrically (*J. Indian Chem. Soc.* 1988, 65, 146).

Distribution : Throughout Himalayas, Meghalaya, upper Gangetic plains to Bihar and Tamil Nadu alt. 300-2400 m.

ALANGIUM (Alangiaceae)

A. chinense (Lour.) Harms syn. *A. kurzii* Craib., *Marlea begoniaefolia* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 27).

β -Amyrin acetate, triacontanol and β -sitosterol isolated from leaves (*J. Nepal Chem. Soc.* 1981, 1, 97; *Chem. Abstr.* 1985, 103, 119976 h).

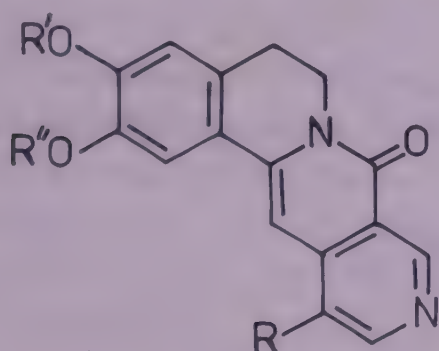
A. kurzii Craib.; see *A. chinense* (Lour.) Harms

A. lamarckii Thwaites; see *A. salvifolium* (L.f.) Wang.

A. salvifolium (L.f.) Wang. syn. *A. lamarckii* Thwaites (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 27).

Five new alkaloids - isoalangimarine, isoalamarine, alangimarinone, dihydroalamarine and dihydroisoalamarine - isolated along with alangimarine, alamarine and alangimaridine and structures of new compounds established (*Indian J. Chem.* 1985, 24B, 19); structure of (+)9-demethylpsychotrine established by synthesis (*Chem. Pharm. Bull.* 1985, 33, 583); structure of bharatamine established by synthesis (*Indian J. Chem.* 1985, 24B, 360; *J. Indian Chem. Soc.* 1985, 62, 1003); total synthesis of (-)alangimarckine (*Chem. Pharm. Bull.* 1985, 33, 1946); synthesis of 10-demethyltubulosine (*Chem. Pharm. Bull.* 1985, 33, 4314); structure and synthesis of 9-demethylcephaeline and 10-demethylcephaeline (*Chem. Pharm. Bull.* 1985, 33, 5264); 9-demethylprotoemetinol and 10-demethylprotoemetinol synthesised (*Chem. Pharm. Bull.* 1987, 35, 2755); synthesis of (-)alancine (*Chem. Pharm. Bull.* 1987, 35, 3470); a new alkaloid - alamaridine - isolated and its stereostructure established and confirmed by synthesis (*Tetrahedron* 1988, 44, 3477).

NEW COMPOUNDS



Isoalangimarine

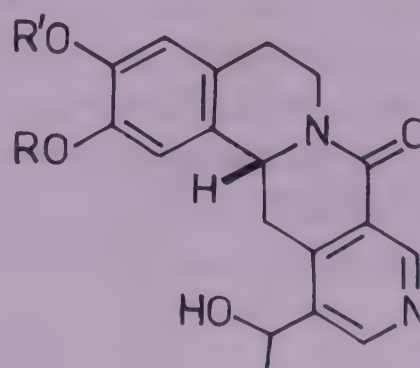
$R = \text{CH}=\text{CH}_2$, $R' = \text{H}$, $R'' = \text{Me}$

Isoalamarine

$R = \text{CH}(\text{OH})\text{Me}$, $R' = \text{H}$, $R'' = \text{Me}$

Alangimarinone

$R = \text{Ac}$, $R' = \text{Me}$, $R'' = \text{H}$

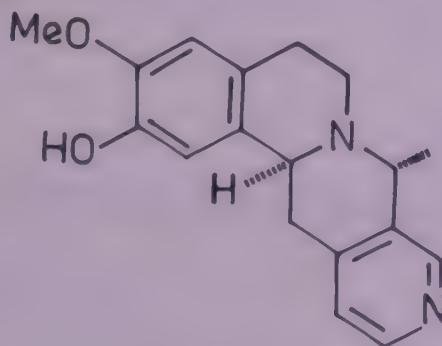


Dihydroalamarine

$R = \text{H}$, $R' = \text{Me}$

Dihydroisoalamarine

$R = \text{Me}$, $R' = \text{H}$



Alamaridine

ALBIZIA (ALBIZZIA) (Mimosaceae)

A. julibrissin Durazz. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 28).

Cis- and trans-linalool oxide, α -ocimene, isopentanol and 4-penten-2-one identified in flowers by GC-MS (*Fenxi Huaxue* 1988, 16, 585; *Chem. Abstr.* 1989, 110, 92059 s).

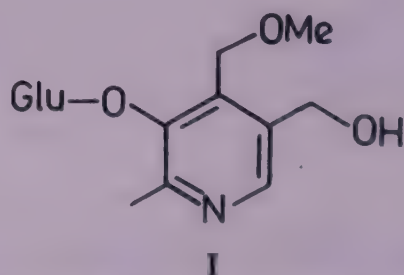
A. lebbek (L.) Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 29).

Saponin fraction and seed extract of plant significantly reduced the number of ruptured mast cells, in both mesenteric bits and peritoneal fluid obtained from sensitised rats and this effect was identical in both types of systemic anaphylaxis (active and passive) (*Indian J. Physiol. Pharmacol.* 1985, 29, 43).

A new saponin isolated from roots and characterised as echinocystic acid-3-O-L-rhamnopyranosyl(1 \rightarrow 5)- β -D-xylofuranosyl(1 \rightarrow 5)- β -D-arabinofuranosyl(1 \rightarrow 4)- β -D-glucopyranoside (*Fitoterapia* 1988, 59, 479).

A. lucida (Roxb.) Benth. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 28).

2-Methyl-4-(methoxymethyl)-5-(hydroxymethyl)pyridine-3-O-glucoside (I) isolated from seeds and characterised (*Gazz. Chim. Ital.* 1989, 119, 63; *Chem. Abstr.* 1989, 111, 36634 j).

NEW COMPOUNDS

A. procera (Roxb.) Benth. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 28).

Detection of linoleic (44.45), palmitic (25.4), oleic (20.18), stearic (4.93), arachidic (2.8) and behenic (2.24%) acids in seed oil by GC (*Indian For.* 1989, 115, 180; *Chem. Abstr.* 1989, 111, 150604 z).

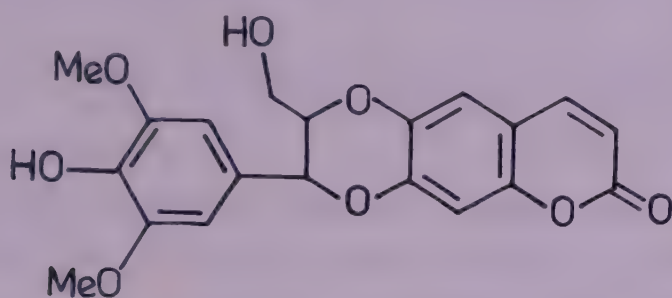
ALECTRA (Scrophulariaceae)

A. indica Benth.; see *Melasma avense* (Benth.) Hand.-Mazz.

ALEURITES (Euphorbiaceae)

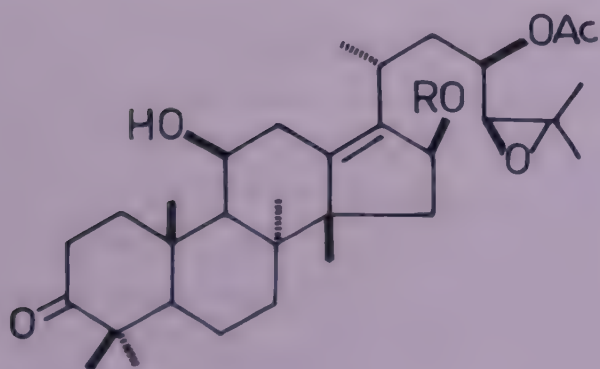
A. moluccana (L.) Willd. (*molluccana*) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 11).

A new coumarinolignoid - moluccanin - isolated from stem and its structure elucidated (*Phytochemistry* 1988, 27, 1908).

NEW COMPOUNDS**Moluccanin****ALISMA (Alismataceae)**

A. plantago-aquatica L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 30).

Two new sesquiterpenoids - alismol and alismoxide - isolated from rhizomes and their structures determined (*Phytochemistry* 1983, 22, 183); two new triterpenes - 16 β -methoxy-alisol B monoacetate and 16 β -hydroxyalisol B monoacetate - isolated from rhizomes and characterised (*Phytochemistry* 1988, 27, 1161).

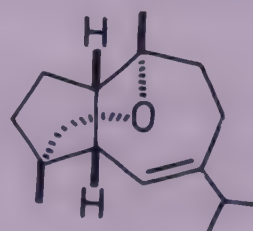
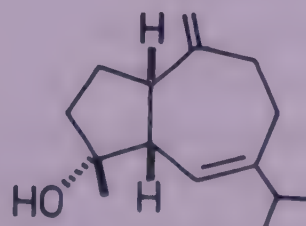
NEW COMPOUNDS

16 β -Methoxyalisol B monoacetate

R = Me

16 β -Hydroxyalisol B monoacetate

R = H

**Alismoxide****Alismol**

BIOLOGICAL ACTIVITY

Alismol at a dose of $100.0 \mu\text{M}$ increased coronary flow without changing cardiac output and heart rate in isolated rat heart; potency of alismol was less than that of nifedipine (*Wakan Iyaku Gakkaishi* 1988, 5, 392; *Chem. Abstr.* 1989, 111, 50174 r).

ALLEMANDA (ALLAMANDA) (Apocynaceae)

A. cathartica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 30).

Total synthesis of allamandin (*Tetrahedron Lett.* 1985, 26, 1807).

A. schottii Pohl.

β -Amyrin, quercetin, rutin, kaempferol, β -sitosterol, plumieride, its coumarate and coumarate glucoside isolated from flowers (*Indian J. Pharm. Sci.* 1988, 50, 134).

Distribution: Introduced into India, in gardens.

ALLIUM (Liliaceae)

A. ampeloprasum L.; see *A. porrum* L.

A. ampeloprasum L. var. *porrum* (L.) Regel; see *A. porrum* L.

A. bakeri Regel; see *A. chinense* G. Don

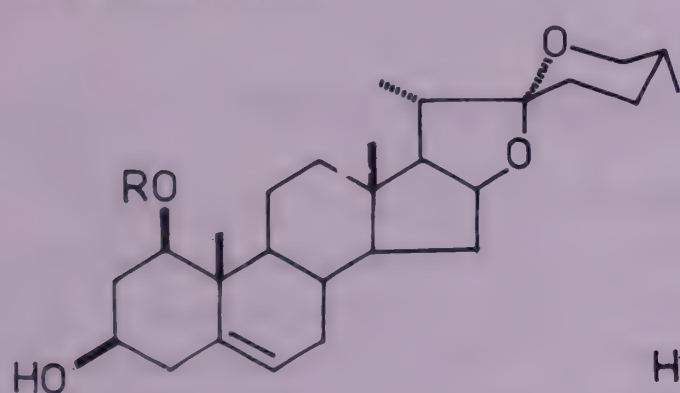
A. cepa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 30).

Two active fractions - T_1 and T_2 - at $1.0 \mu\text{g}$ exhibited activity equivalent to that of 1.33 and 0.63 ng respectively, of prostaglandin E_2 (*Prostaglandins* 1985, 29, 847; *Chem. Abstr.* 1985, 103, 68281 t).

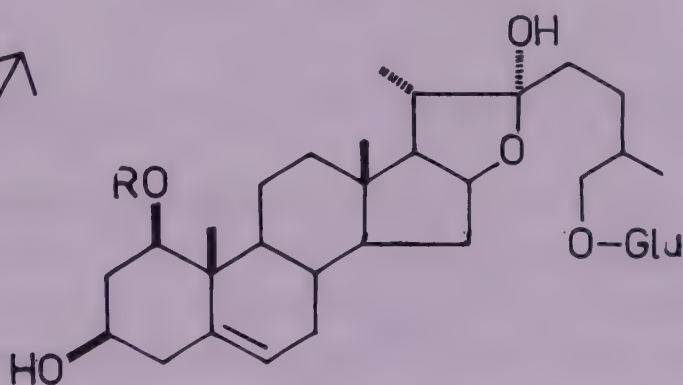
Lipoxygenase metabolites of linoleic acid - isomeric 9,10,13-trihydroxy-11-octadecenoic acid (56.7%) and 9,12,13-trihydroxy-10-octadecenoic acid (43.3%) isolated from bulbs and characterised (*Prostaglandins* 1985, 29, 847; *Chem. Abstr.* 1985, 103, 68281 t; *Prog. Lipid Res.* 1986, 25, 53; *Chem. Abstr.* 1987, 106, 153029 y); seeds contained protein (20.0) and oil (17.3%); unsaturated fatty acids (89.20) comprised of linoleic (59.06) and oleic (29.29%) acids; unsaponifiable part composed of stigmasterol, β -sitosterol, α - and β -tocopherols and C16 and C20 unsaturated alcohols (*Hrana Ishrana* 1985, 25, 167; *Chem. Abstr.* 1985, 103, 175464 b); carbohydrate fraction of white onion bulbs composed of water-soluble polysaccharides (6.0), pectins (4.9) and hemicellulose (0.17%) (*Khim. Priir. Soedin.* 1985, 174; *Chem. Abstr.* 1985, 103, 85042 h); isolation of allylmethyl trisulphide from oil and its synthesis (*Nihon Daigaku No-juigakubu Gakujutsu Kenkyu Hokoku* 1985, 68; *Chem. Abstr.* 1985, 103, 5867 t); two new steroid glycosides - alliospiroside A and alliofuroside A - isolated from reproductive organs

and characterised (*Khim. Prir. Soedin.* 1986, 188; *Chem. Abstr.* 1987, 106, 15707 s); isolation of prostaglandins F1 α , E1, B1 and A2 from leaves (*Comp. Biochem. Physiol. C. Comp. Pharmacol. Toxicol.* 1986, 85C, 163; *Chem. Abstr.* 1986, 105, 222788 p); new steroidal glycoside - alliospiroside B - isolated and its structure determined; its acid hydrolysis yielded 25(S)ruscogenin (*Khim. Prir. Soedin.* 1986, 589; *Chem. Abstr.* 1987, 106, 135236 j); cholesterol, brassicasterol, campesterol, stigmasterol, β -sitosterol, avenasterol-5-ene and stigmasterol-7-ene from seeds of bulb (*F.E.C.S. Int. Conf. Chem. Biotechnol., Biol. Act. Nat. Prod. [Proc.]*, 3rd, 1987, 5, 166; *Chem. Abstr.* 1988, 109, 226731 v); prostaglandin A1 from bulbs (*Zhongcaoyao* 1988, 19, 146; *Chem. Abstr.* 1988, 109, 79562 k); isolation and synthesis of two bicyclic sulphoxides - (1 α ,2 α ,3 α ,4 α ,5 β)- and (1 α ,2 α ,3 β ,4 α ,5 β)-2,3-dimethyl-5,6-dithiabicyclo [2.1.1] hexane-5-oxide (*J. Am. Chem. Soc.* 1989, 111, 3085); isolation and structure determination of ceposide D from seeds (*Khim. Prir. Soedin.* 1989, 139; *Chem. Abstr.* 1989, 111, 93884 q).

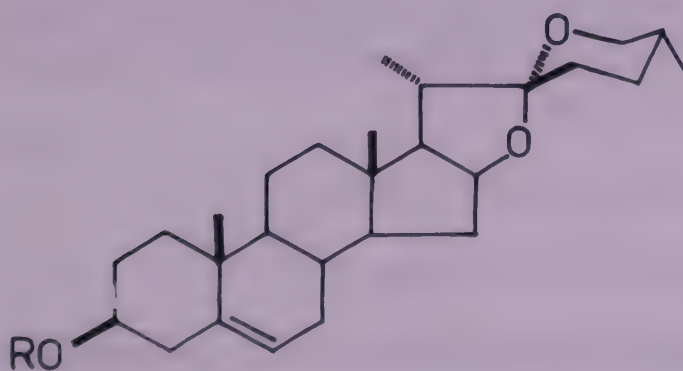
NEW COMPOUNDS



Alliospiroside A
R = Ara(2 \rightarrow 1)Rha
Alliospiroside B
R = Gal(2 \rightarrow 1)Rha



Alliofuroside A
R = Ara(2 \rightarrow 1)Rha



Ceposide D
R = Ara(2 \rightarrow 1)Rha(4 \rightarrow 1)Gal[(2 \rightarrow 1)Glu](3 \rightarrow 1)Glu

BIOLOGICAL ACTIVITY

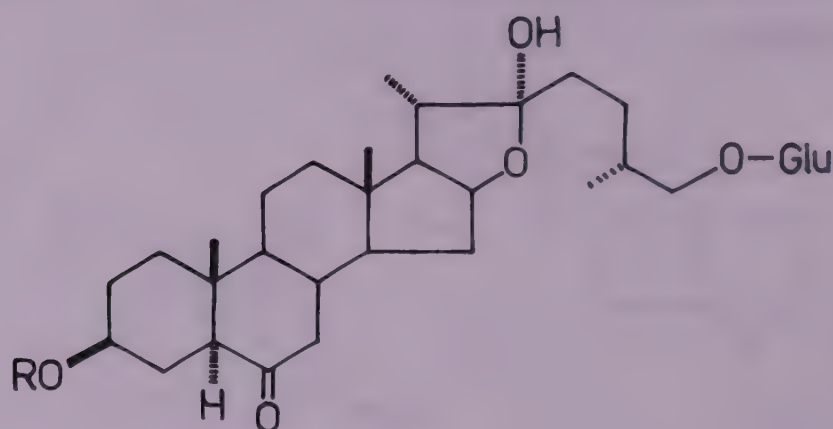
9,10,13-Trihydroxy-11-octadecenoic acid and 9,12,13-trihydroxy-10-octadecenoic acid

exhibited PGE-like activity (*Prog. Lipid Res.* 1986, 25, 53; *Chem. Abstr.* 1987, 106, 153029 y); quercetin significantly reduced the number of ruptured mast cells in both mesenteric bits and peritoneal fluid obtained from sensitized rats and the effect was identical in both types of systemic anaphylaxis (*Indian J. Physiol. Pharmacol.* 1985, 29, 43).

A. chinense G. Don syn. *A. bakeri* Regel (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 31).

Isolation of N-p-coumaroyltyramine, N-trans-feruloyltyramine, N-trans-caffeoyltyramine, N-trans-O-hydroxycinnamoyltyramine and caffeic and 3,4-dimethoxycinnamic acids (*Planta Med.* 1986, 52, 171); new furostanol glycoside - chinenoside I - isolated and its structure elucidated (*Chem. Pharm. Bull.* 1989, 37, 1390).

NEW COMPOUNDS



Chinenoside I

R = Glu[(4→1)Xyl](6→1)Ara

BIOLOGICAL ACTIVITY

N-p-Coumaroyltyramine and 3,4-dimethoxycinnamic acid exhibited inhibitory effect against primary wave aggregation, while N-trans-feruloyltyramine inhibited both primary and secondary wave aggregation induced by $2\mu\text{M}$ ADP. Caffeic acid and N-trans-caffeoyltyramine also inhibited both types of platelet aggregation while N-trans-O-hydroxycinnamoyltyramine showed lesser effect (*Planta Med.* 1986, 52, 171).

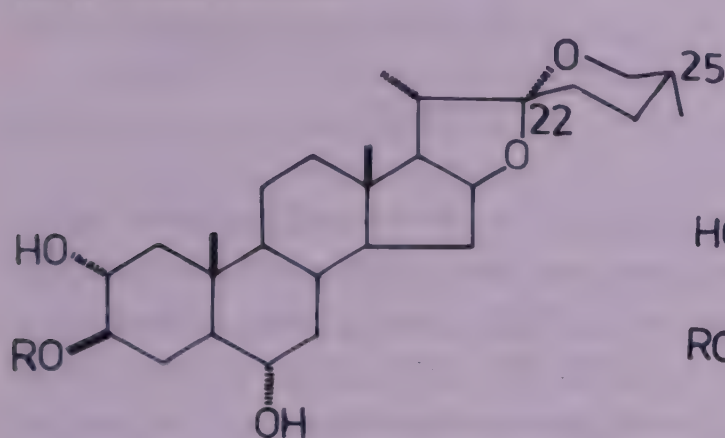
A. clarkei Hook.f.; see *A. tuberosum* Rottl. ex Spreng.

A. odorum L.; see *A. tuberosum* Rottl. ex Spreng.

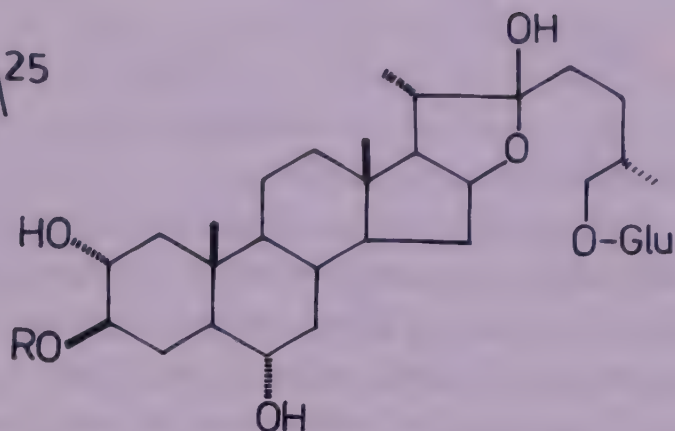
A. porum L. syn. *A. ampeloprasum* sensu Hook.f. (non L.), *A. ampeloprasum* L. var. *porum* (L.) Regel (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 11).

A new spirostane saponin - ampeloside Bs1 - and two furostane-type saponins - ampelosides Bf1 and Bf2 - isolated along with prosapogenins of aginoside; new saponins characterised (*Chem. Pharm. Bull.* 1988, 36, 3480).

NEW COMPOUNDS



Ampeloside Bs1

$$R = \text{Gal}(4 \rightarrow 1)\text{Glu}(3 \rightarrow 1)\text{Glu}$$


Ampeloside Bf1

$$R = \text{Gal}(4 \rightarrow 1)\text{Glu}(3 \rightarrow 1)\text{Glu}$$

Ampeloside Bf2

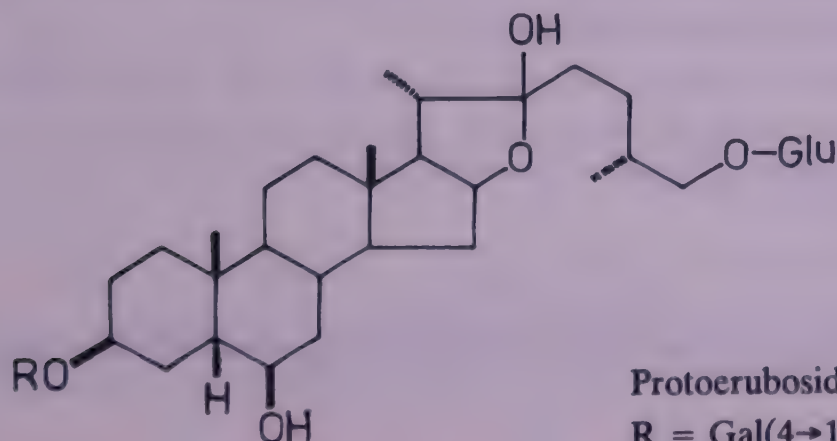
$$R = \text{Gal}(4 \rightarrow 1)\text{Glu}$$

A. sativum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 31).

Enhancement of phospholipid metabolism, an initial action caused by tumor promoter 12-O-tetradecanoylphorbol-13-acetate, inhibited by plant extract; it also suppressed the first stage of tumor promotion in 2-stage mouse skin carcinogenesis *in vivo* (*Oncology* 1989, 46, 277; *Chem. Abstr.* 1989, 111, 89940 n); platelet adhesion to polycarbonate film surface was decreased by 0.05-0.5 ml garlic oil/ml of platelet-rich plasma; thus, extract inhibited platelet aggregation (*Thromb. Res.* 1985, 37, 489; *Chem. Abstr.* 1985, 102, 178877 d).

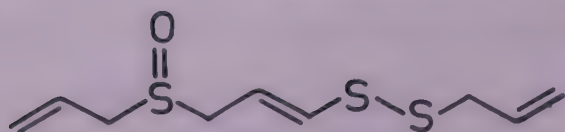
An organosulphur compound - ajoene - isolated from garlic extract; E and Z isomers of ajoene separated by HPLC and its structure determined as (E & Z)4,5,9-trithiadodeca-1,6,11-triene-9-oxide; diallyl disulphide, diallyl trisulphide, 3-vinyl-4H[1,2]-dithiin and 2-vinyl-4H[1,3]-dithiin also isolated (*J. Am. Chem. Soc.* 1986, 108, 7045); a new furostanol glycoside - protoeruboside B - isolated from bulbs and its structure elucidated (*Chem. Pharm. Bull.* 1988, 36, 3659).

NEW COMPOUNDS



Protoeruboside B

$$R = \text{Gal}(4 \rightarrow 1)\text{Glu}[(2 \rightarrow 1)\text{Glu}](3 \rightarrow 1)\text{Glu}$$



(E)Ajoene



(Z)Ajoene

BIOLOGICAL ACTIVITY

Ajoene showed strong inhibition of platelet aggregation; data on antithrombotic activity of a variety of synthetic structures related to ajoene, have been used to explain the molecular basis for activity of ajoene which is attributed to its ability to alter platelet membranes by capturing sulphhydryl groups (*J. Am. Chem. Soc.* 1986, 108, 7045); allicin inhibited human platelet aggregation *in vitro* without affecting cyclooxygenase or thromboxane synthase activity or cAMP level; it also inhibited ionophore A 23187-stimulated human neutrophil lysosomal enzyme release but did not alter activity of vascular prostacyclin synthase. Allicin, *in vivo*, dilated mesenteric circulation of cat independent of prostaglandin release or β -adrenergic mechanism (*Agents Actions* 1988, 25, 182; *Chem. Abstr.* 1988, 109, 104168 a).

A. tuberosum Rottl. ex Spreng. syn. *A. tuberosum* Roxb., *A. clarkei* Hook.f., *A. odorum* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 32).

Isolation of (-)-3(S)-1,2,3,4-tetrahydro- β -carboline-3-carboxylic acid and tyrosine from leaves (*Arch. Pharmacol Res.* 1988, 11, 270; *Chem. Abstr.* 1989, 110, 228627 k).

A. tuberosum Roxb.; see *A. tuberosum* Rottl. ex Spreng.

A. wallichii Kunth

Diosgenin (0.21) and tigogenin (0.13%) isolated from bulbs (*Pharmazie* 1984, 39, 707; *Chem. Abstr.* 1985, 102, 93017 y); imperatorin, β -sitosterol glucoside and aurantiamide acetate from whole plant (*Indian J. Chem.* 1989, 28B, 356).

Distribution : Himalayas, from Kumaon to Sikkim, alt. 2400-3900 m.

ALOYSIA (Verbenaceae)

A. triphylla (L'Herit.) Britton syn. *Lippia citriodora* H.B. & K. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 33).

Isolation of salvigenin, eupatorin, eupafolin, luteolin, 6-hydroxyluteolin, luteolin-7-O- β -glucoside, hispidulin, cirsimaritin, diosmetin, chrysoeriol, apigenin, pectolinarigenin and cirsiol from leaves (*Planta Med.* 1988, 54, 465).

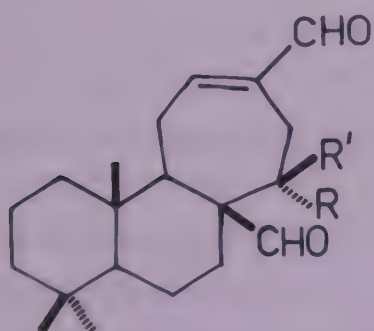
ALPINIA (Zingiberaceae)

A. galanga Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 33).

Essential oil from rhizomes exhibited antimicrobial activity against Gram-positive bacteria (*Planta Med.* 1985, 51, 507).

Isolation of 1'-acetoxychavicol acetate, 1'-acetoxyeugenol acetate and 1'-hydroxychavicol acetate (*Planta Med.* 1985, 51, 507; *ibid.* 1987, 53, 32); two new diterpenes - galanal A and galanal B (15-epimer of galanal A) - isolated from seeds and their structures established (*Chem. Lett.* 1986, 1205; *Chem. Abstr.* 1986, 105, 130685 z; *Planta Med.* 1988, 54, 117); galanolactone, (E)8(17),12-labdadien-15,16-dial and (E)8(17)-epoxylabd-12-en-15,16-dial isolated from seeds and characterised (*Planta Med.* 1988, 54, 117); isolation of a new compound - di(p-hydroxy-cis-styryl)methane - along with p-hydroxycinnamaldehyde from rhizomes (*Phytochemistry* 1987, 26, 2126).

NEW COMPOUNDS

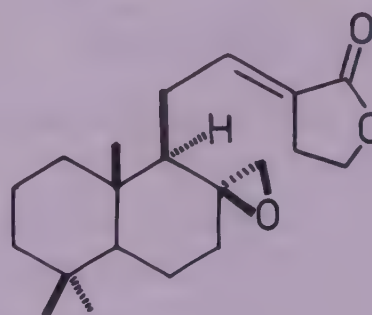


Galanal A

R = OH, R' = H

Galanal B

R = H, R' = OH



Galanolactone

BIOLOGICAL ACTIVITY

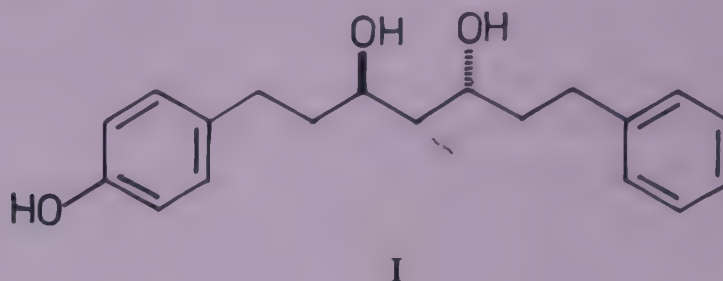
1'-Acetoxychavicol acetate was active against seven fungi, its minimum inhibitory concentration ranging from 50.0 to 250.0 $\mu\text{g/ml}$; 1'-acetoxyeugenol acetate and 1'-hydroxychavicol acetate also showed antifungal activity (*Planta Med.* 1985, 51, 507); 1'-acetoxychavicol acetate and 1'-acetoxyeugenol acetate exhibited antitumor activity against sarcoma 180 ascites in mice; presence of 1'-acetoxy group in these compounds essential for antitumor activity (*Planta Med.* 1987, 53, 32); galanals A and B, galanolactone, (E)8(17),12-labdadien-15,16-dial and (E)8(17)-epoxylabd-12-en-15,16-dial showed cytotoxic and antifungal activities (*Planta Med.* 1988, 54, 117).

A. officinarum Hance (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 33).

Isolation of three new diarylheptanoids - 7-(4'-hydroxyphenyl)-1-phenyl-4-hepten-3-one, 5-methoxy-7-(4'-hydroxyphenyl)-1-phenyl-3-heptanone and 5-methoxy-1,7-diphenyl-3-heptanone - from rhizomes (*Chem. Pharm. Bull.* 1985, 33, 4889); new diarylheptanoid -

(3R,5R)1-(4''-hydroxyphenyl)-7-phenylheptane-3,5-diol (I) - isolated from rhizomes (*Chem. Pharm. Bull.* 1987, 35, 3298).

NEW COMPOUNDS



ALSOPHILA (Cyatheaceae)

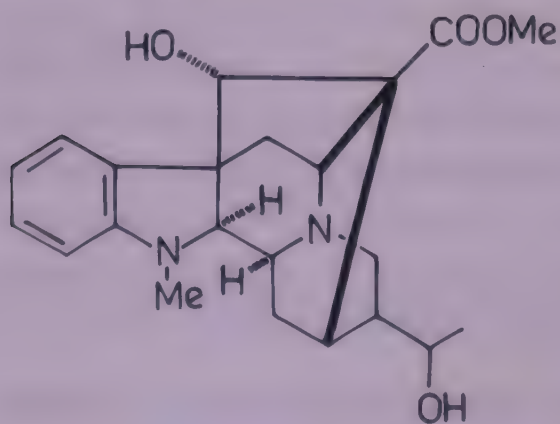
A. spinulosa Tryon; see *Cyathea spinulosa* Wall. ex Hook.

ALSTONIA (Apocynaceae)

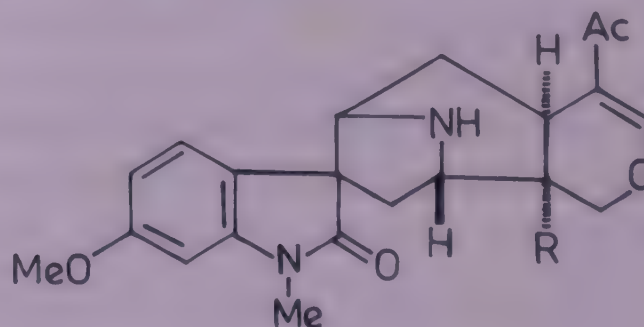
A. macrophylla G.Don (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 35).

Nb-Demethylalstophylline oxindole isolated from leaves (*Phytochemistry* 1987, 26, 865); a new alkaloid - 19-hydroxyvincamajine - isolated from leaves whereas alstonerine, alstophylline, macralstonine, anhydromacralstonine, talcarpine, vincamajine, vincorine and cabucraline isolated from both bark and leaves; new alkaloid characterised and ¹³C-NMR spectra of alstonerine and alstophylline determined (*Phytochemistry* 1987, 26, 868); isolation of 16-hydroxy-Nb-demethylalstophylline oxindole from leaves together with N-methyl-1,2-dihydrostrictamine and its structure determination (*Heterocycles* 1988, 27, 725); new picraline alkaloid - alstopicralamine - along with vincamajine isolated from Sri Lankan plant (*Heterocycles* 1988, 27, 961); isolation of new alkaloid - (-)-strictaminolamine - together with (-)-1,2-dihydro-N-methylstrictamine (*Phytochemistry* 1988, 27, 3653).

NEW COMPOUNDS



19-Hydroxyvincamajine

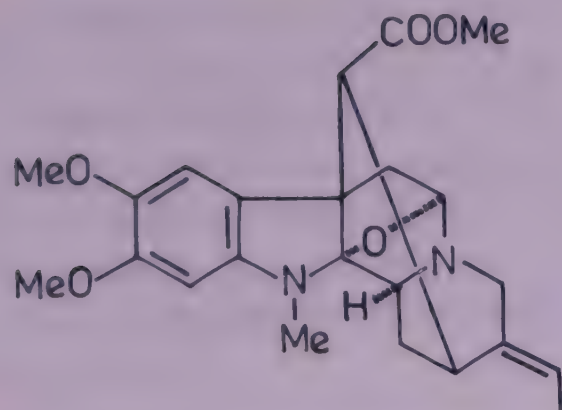


Nb-Demethylalstophylline oxindole

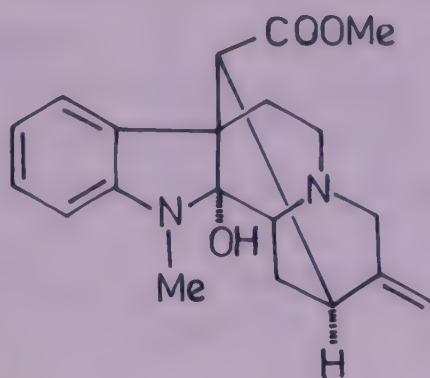
R = H

16-Hydroxy-Nb-demethylalstophylline oxindole

R = OH



Alstopicralamine



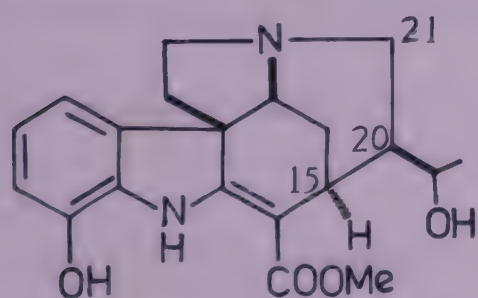
Strictaminolamine

A. scholaris (L.) R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 34).

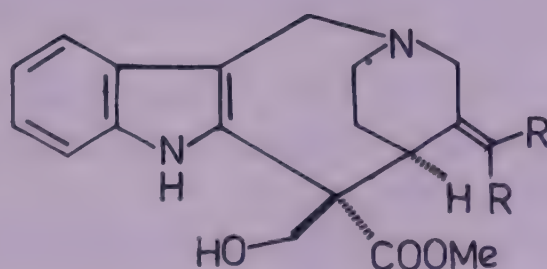
Alcoholic extract of bark showed antimicrobial activity against *Salmonella paratyphi-B* and *Aspergillus niger* (*Comp. Physiol. Ecol.* 1989, 14, 1; *Chem. Abstr.* 1989, 111, 150578 u).

Isolation and structure elucidation of a new alkaloid - scholaricine (*Phytochemistry* 1985, 24, 2771); a new flavone glycoside isolated from roots and characterised as isookanin-7-O-rhamnoside(8,3',4'-trihydroxyflavanone-7-O- α -L-rhamnopyranoside) (*Indian J. Chem.* 1985, 24B, 219); isolation of 20(S)-19,20-dihydrocondylocarpine from leaves and its stereochemistry and NMR studies (*Planta Med.* 1986, 52, 325); isolation and stereochemistry of (E) and (Z)19,20-vallesamines (*Heterocycles* 1987, 26, 413); alstonamine, a new indole alkaloid, isolated from leaves together with rhazimanine and its structure determined (*Phytochemistry* 1987, 26, 2139); p-menthane-1,2,8-triol from flowers (*Indian Drugs* 1987, 24, 321); crystal structure of picrinine (*Acta Crystallogr., Cryst. Struct. Commun.* 1988, 44C, 2151; *Chem. Abstr.* 1989, 111, 154190 j); new indole alkaloid - alschomine - isolated from leaves along with its C-5 isomer, isoalschomine as well as picrinine, picralinal and nareline; structure of alschomine determined by X-ray analysis (*Chem. Pharm. Bull.* 1989, 37, 887).

NEW COMPOUNDS



Scholaricine

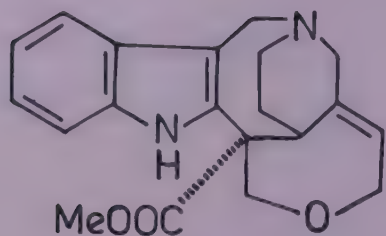


(19,20Z)Vallesamine

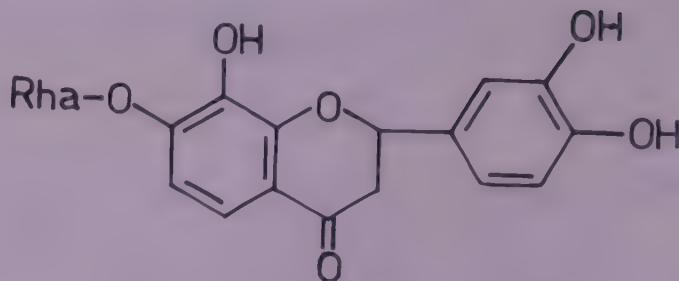
R = H, R' = Me

(19,20E)Vallesamine

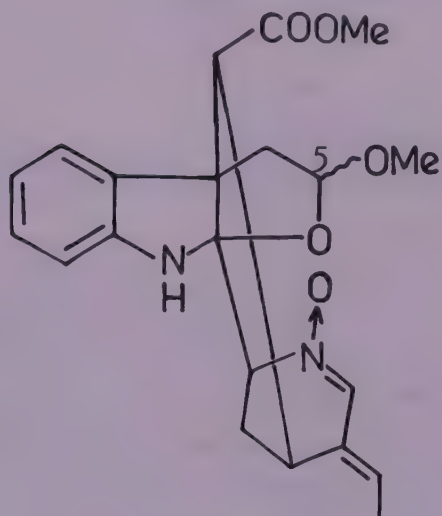
R = Me, R' = H



Alstonamine



Isookanin-7-O-rhamnoside

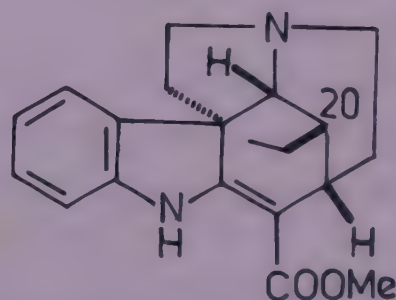


Alschomine

~ = α

Isoalschomine

~ = β



20(S)19,20-Dihydrocondylocarpine

ALTERNANTHERA (Amaranthaceae)

A. nodiflora R.Br.; see *A. sessilis* (L.) R.Br. ex DC.

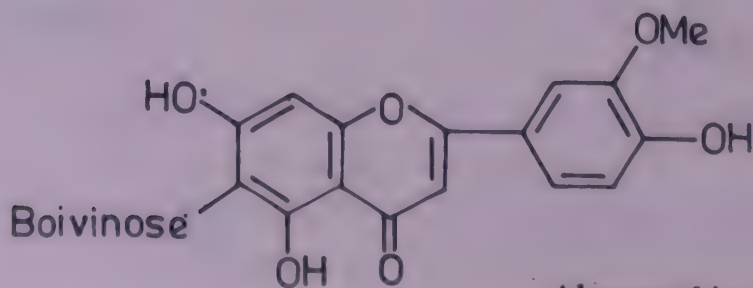
A. philoxeroides (Mart.) Griseb.

Eng. - Alligator weed.

Isolation and structure elucidation of a new flavone glycoside - alternanthin (*Phytochemistry* 1988, 27, 3633).

Distribution : Native to South America, aquatic weed found almost throughout plains of India.

NEW COMPOUNDS



Alternanthin

A. pungens H.B. & K. syn. *A. repens* (L.) Link (non Gmel.) (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 37).

Determination of azulene (3.16), α -borneol (4.46), bornyl acetate (3.82), camphene (4.21), camphor (5.52), 1,8-cineol (6.28), α -curcumene (2.36), p-cymene (4.29), elemol acetate (6.14), eudesmol (5.38), geraniol (7.42), limonene (3.52), linalool (6.29), myrcene (3.61), β -ocimene (2.35), α -pinene (7.40), β -pinene (4.21), α -terpineol (3.82), α -terpinolene (5.38) and α -thujone (3.62%) in flower oil by GC (*Indian Perfum.* 1987, 31, 366; *Chem. Abstr.* 1988, 109, 167320 k).

A. repens Gmel.; see *A. pungens* H.B. & K.

A. sessilis (L.) R.Br. ex DC. syn. *A. nodiflora* R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 36).

A saponin having oleanolic acid as aglycone and glucose and rhamnose as sugars isolated from leaves (*Bull. Soc. R. Sci. Liege* 1986, 55, 605; *Chem. Abstr.* 1987, 107, 4297 c).

ALTHAEA (Malvaceae)

A. officinalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 36).

Tiliroside, kaempferol-3-glucoside, quercetin-3-glucoside, diosmetin-8-O-glucoside and its 3'-SO₃K derivative isolated from leaves (*Acta Pol. Pharm.* 1985, 42, 192; *Chem. Abstr.* 1986, 104, 183294 g); p-coumaric, caffeic, ferulic, vanillic, p-hydroxybenzoic and chlorogenic acids from leaves (*Farmatsiya* 1986, 36, 15; *Chem. Abstr.* 1986, 105, 94531 k); two new flavonoid glycosides - hypoletin-8-glucoside and hypoletin-8- β -gentiobioside - isolated from leaves (*Acta Pol. Pharm.* 1987, 44, 369; *Chem. Abstr.* 1988, 109, 89750 j); isolation of tiliroside, naringenin-4'- β -D-glucoside and dihydrokaempferol-4'- β -D-glucoside from flowers and calyxes; identification of kaempferol-3-glucoside, quercetin-3-glucoside, 8-hydroxyluteolin-8-gentiobioside and salicylic, vanillic, ferulic, syringic, caffeic, p-hydroxybenzoic, p-coumaric and p-hydroxyphenylacetic acids by chromatography (*Acta Pol. Pharm.* 1988, 45, 340; *Chem. Abstr.* 1989, 110, 209342 x).

A. rosea (L.) Cav. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 36).

Isolation of rutin, chrysin, kaempferol, robinetin, acacetin and phloretin from flowers (*Indian Drugs* 1984, 21, 468).

ALYSICARPUS (Papilionaceae)

A. bupleurifolius (L.) DC. var. *bupleurifolius*

Guj. - Ad samerwo; Mundari - Nari jatanri ba.

Aliphatic C28-34 alcohols, C27-34 hydrocarbons, β -sitosterol glucoside, D(+)pinitol and meso-inositol isolated (*J. Indian Chem. Soc.* 1986, 63, 531).

Distribution : Throughout plains of India, ascending to 1200 m in hills.

A. longifolius (Rottl. ex Spreng.) Wt. & Arn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 36).

Quercetin-7-O-rhamnoside, chrysoeriol-7-O-xyloside and kaempferol-3-O-xylosyl-7-O-rhamnoside isolated from leaves (*Fitoterapia* 1986, 57, 183).

AMARANTHUS (Amaranthaceae)

A. gangeticus L.; see *A. tricolor* L.

A. tricolor L. syn. *A. gangeticus* L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 28).

Isolation of C25-35 alkanes, C24-32 aliphatic alcohols, cholesterol, campesterol, 24-methylenecholesterol, stigmasterol, sitosterol, fucosterol, 28-isofucosterol, proline, cysteine, tryptophan, phenylalanine, serine, glutamic acid, arginine, leucine, glucose and fructose (*Acta Cienc. Indica, Chem.* 1984, 10, 42; *Chem. Abstr.* 1985, 103, 102046 g).

A. viridis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 37).

Identification of spinesterol (24-ethyl-22-dehydrolathosterol) as major component along with 24-methylathosterol, 24-ethylathosterol, 24-methyl-22-dehydrolathosterol, 24-ethyl-cholesterol and 24-ethyl-22-dehydrocholesterol as minor components in sterol fraction (*Fitoterapia* 1986, 57, 276).

AMARYLLIS (Amaryllidaceae)

A. belladonna L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 37).

Isolation of acetylcaranine, undulatine and ambelline from bulbs (*J. Nat. Prod.* 1984, 47, 796).

BIOLOGICAL ACTIVITY

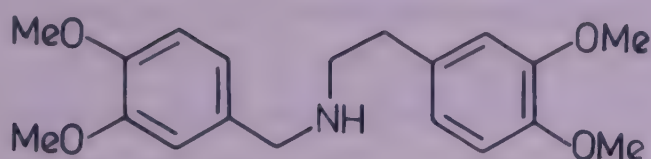
Acetylcaranine (ED₅₀ 0.23 μ g/ml) and ambelline (ED₅₀ 1.6 μ g/ml) showed activity against murine P-388 lymphocytic leukaemia (*J. Nat. Prod.* 1984, 47, 796).

A. vittata Ait.

Isolation of ryllistine from flowers and its structure elucidation and synthesis (*J. Chem. Res. Synop.* 1984, 412).

Distribution : Introduced into Indian gardens.

NEW COMPOUNDS



Ryllistine

AMBERBOA (Asteraceae)

A. divaricata (DC.) Kuntze; see *A. ramosa* (Roxb.) Jafri

A. ramosa (Roxb.) Jafri syn. *Oligochaeta ramosa* (Roxb.) Wagenitz, *Amberboa divaricata* (DC.) Kuntze, *Volutarella divaricata* Benth. & Hook.f., p.p., *Tricholepsis procumbens* Wt. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 459).

Jaceosidine, apigenin, cynaropicrin, chrysoeriol and its 7-O-glucoside, tracheloside, β -sitosterol and its glucoside isolated (*Fitoterapia* 1984, 55, 189).

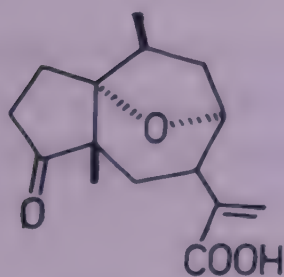
AMBROSIA (Asteraceae)

A. artemisiifolia L.

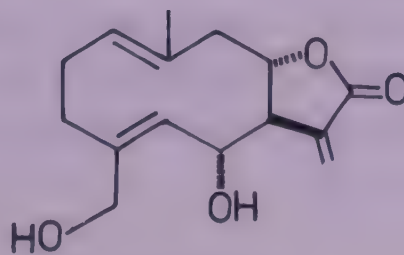
Structure elucidation of artemisiifolin, isolated from leaves and stems along with isabelin, and its synthesis (*Phytochemistry* 1970, 9, 199); isolation of poisonous substance - ambrosic acid - from pollens and determination of its crystal structure (*Chem. Pharm. Bull.* 1974, 22, 1435; *Tetrahedron Lett.* 1974, 809); artemisia ketone (3,3,6-trimethyl-1,5-heptadien-4-one) (33.0%) isolated from oil of aerial parts (*Khim. Pri. Soedin.* 1984, 529; *Chem. Abstr.* 1985, 102, 3262 x); isolation and structure elucidation of 4-oxo-3,4-secoambrosan-6,12-olide-3-oic acid (I); cumenin and its diacetate, 8 α -acetoxy-3-oxo-pseudoguaian-6,12-olide and psylostachin C also isolated (*Phytochemistry* 1987, 26, 850).

Distribution : Arunachal Pradesh, Meghalaya and Uttar Pradesh.

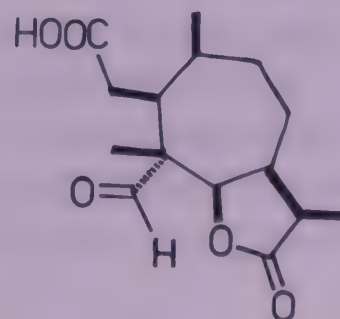
NEW COMPOUNDS



Ambrosic acid



Artemisiifolin



I

AMMANNIA (Lythraceae)

A. baccifera L. syn. *A. salicifolia* sensu Clarke, p.p. (non Monti ex Blume) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 15).

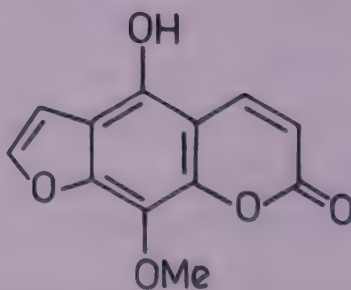
Hentriacontane, dotriacontanol and β -sitosterol glucoside from fruits and leaves, triacontan-1,30-diol from fruits only, ellagic acid and quercetin from leaves only and betulinic acid and lupeol from roots (*J. Indian Chem. Soc.* 1986, 63, 619).

A. salicifolia Monti ex Blume; see *A. baccifera* L.

AMMI (Apiaceae)

A. visnaga (L.) Lam. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 39).

Isolation of xanthotoxin and ammidin from fruits of plant grown in Pakistan (*J. Nat. Prod.* 1985, 48, 496); narcissin, 3-O- β -D-glucopyranosyl-5,4'-dihydroxy-7,3'-dimethoxyflavone, 3-O- β -D-triglucopyranosyl-5,7,4'-trihydroxy-3'-methoxyflavone, rhamnetin, isorhamnetin and rhamnazine isolated from fruits (*Pol. J. Chem.* 1986, 60, 77; *Chem. Abstr.* 1987, 107, 36658 n); isolation of 2-methyl-5-hydroxy-7- β -D-glucopyranosyloxymchromone (*Pol. J. Chem.* 1986, 60, 837 ; *Chem. Abstr.* 1987, 107, 112695 q); isolation and characterisation of a new furano-coumarin - 4-hydroxy-9-methoxy-7H-furo[3.2-g]-1-benzopyran-7-one (I) - from fruits (*Pol. J. Chem.* 1986, 60, 91; *Chem. Abstr.* 1987, 107, 20784 q); isolation of ammiol and khellol glucosides from seeds and their proton and ¹³C-NMR spectra determination (*J. Nat. Prod.* 1989, 52, 655).

NEW COMPOUNDS**I****BIOLOGICAL ACTIVITY**

Khellin inhibited vascular smooth muscle contractions in rat aorta induced by noradrenaline; it also relaxed both noradrenaline-induced contractile tension in rat aorta smooth muscle and spontaneous contractile activity of rat portal vein with similar potency (*J. Pharm. Pharmacol.* 1989, 41, 236).

AMOMUM (AMMOMUM) (Zingiberaceae)

A. compactum Roem. & Schult.; see *Elettaria cardamontum* (L.) Maton

A. xanthioides Wall. ex Baker (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 39).

Detection of bornyl acetate and camphor in essential oil by GC (Yaowu Fenxi Zazhi 1985, 5, 359; *Chem. Abstr.* 1986, 104, 95330 k).

AMOORA (Meliaceae)

A. rohituka W. & A.; see *Aphanamixis polystachya* (Wall.) Parker

AMPHICOME (Bignoniaceae)

A. arguta Royle; see *Incarvillea arguta* (Royle) Royle

AMYGDALUS (Rosaceae)

A. communis L.; see *Prunus dulcis* (Mill.) D.A. Webb.

ANACARDIUM (Anacardiaceae)

A. occidentale L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 39).

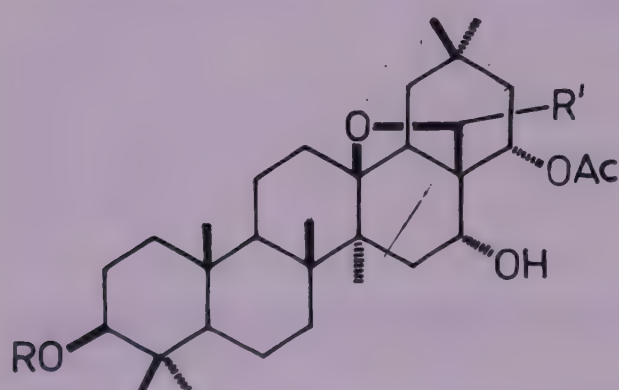
Essential oil inhibited spontaneous motor activity, potentiated pentobarbitone-induced hypnosis, caused deterioration of rota-rod performance and blocked conditioned avoidance response in rats; it also had hypothermic action and marked dose-related analgesic effect (*Fitoterapia* 1984, 55, 131); tannins from bark, on i.v. administration, exhibited anti-inflammatory activity in carrageenin and dextran-induced rat paw oedema, cotton pellet granuloma test and adjuvant-induced arthritis in rats. Intravenous administration of tannins inhibited AcOH-induced writhing response in mice, antagonised permeability-increasing effect of inflammation mediators and inhibited leukocyte migration towards inflammation site. High doses of tannins, on oral administration, also had anti-inflammatory activity in carrageenin-induced rat paw oedema and adjuvant arthritis (*J. Ethnopharmacol.* 1985, 13, 289).

Isolation of β -sitosterol, stigmasterol, campesterol and cholesterol from stem bark (*J. Indian Chem. Soc.* 1987, 64, 647); myricetin, agathisflavone, robustaflavone, amentoflavone, quercetin, kaempferol, apigenin, quercetin-3-O-rhamnoside and quercetin-3-O-glucoside from leaves (*J. Indian Chem. Soc.* 1989, 66, 67).

ANAGALLIS (Primulaceae)

A. arvensis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 39).

A new saponin, partially characterised as 23-hydroxyprotoprimulagenin A-3-O-glucosyl(1→3 or 4)[arabinosyl(1→4 or 3)]-glucosyl(1→2)xyloside, isolated together with another saponin containing an additional glucose moiety (*Phytochemistry* 1987, 26, 787); saponins - AS1, AS2, AS6 and AS7 - isolated; AS1 and AS2 on acid hydrolysis afforded priverogenin A whereas 3 β ,16 α ,23,28-tetrahydroxyolean-12-ene was obtained from AS6 and AS7; all saponins contained glucose, arabinose and xylose (*Arch. Pharm.* 1987, 320, 1083; *Chem. Abstr.* 1987, 107, 233177 f); new triterpene saponins - anagallosides A, B, C and desglucoanagallosides A and B - isolated and characterised (*Planta Med.* 1987, 53, 548).

NEW COMPOUNDS**Anagalloside A**

R = X, R' = OH

Anagalloside C

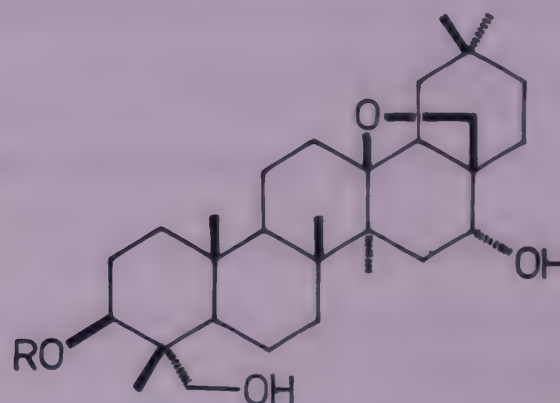
R = X, R' = H

Desglucoanagalloside A

R = Y, R' = OH

X = Ara[(2→1)Glu](4→1)Glu[(2→1)Xyl](4→1)Glu

Y = Ara[(2→1)Glu](4→1)Glu(2→1)Xyl

**Anagalloside b**

R = X

Desglucoanagalloside B

R = Y

ANANAS (Bromeliaceae)

A. comosus (L.) Merr. syn. *A. sativus* Schult.f. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 42).

Bromelain, an extract of stem, inhibited growth of Lewis lung carcinoma, YC-8 lymphoma and MCA-1 ascites tumor cells *in vitro*; its cytotoxic effects abolished by heating at 100° or by addition of aspirin (*Planta Med.* 1985, 51, 538).

A. sativus Schult.f.; see *A. comosus* (L.) Merr.

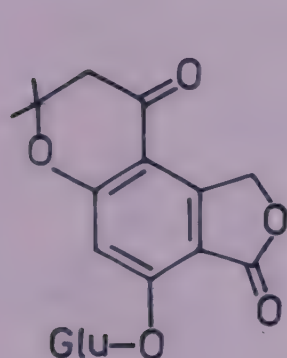
ANAPHALIS (Asteraceae)

A. araneosa DC.; see *A. busua* (D.Don)DC.

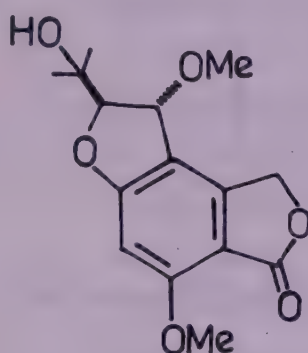
A. busua (D.Don)DC. syn. *A. araneosa* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 40).

Isolation of new prenylated phthalides - araneophthalide, phthalidochromene and araneochromanophthalide - from aerial parts (*Phytochemistry* 1987, 26, 580).

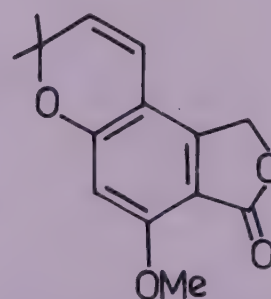
NEW COMPOUNDS



Araneochromanophthalide



Araneophthalide



Phthalidochromene

A. cinnamomea Clarke; see *A. margaritacea* (L.) Benth. & Hook.f.

A. contorta (D.Don) Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 40).

Detection of α -thujene, α -thujol and nerol in essential oil (*Indian Perfum.* 1984, 28, 171; *Chem. Abstr.* 1985, 103, 27058 g).

A. margaritacea (L.) Benth. & Hook.f. syn *A. cinnamomea* Clarke

Kumaon - Vernapata.

Hexyl 2-methylbutyrate, heptyl 2-methylbutyrate and phenethyl 2-methylbutyrate identified by GC-MS in oil of plant grown in China (*Dev. Food Sci.* 1988, 18, 309; *Chem. Abstr.* 1988, 109, 196880 y).

Distribution : Himalayas from Kashmir to Bhutan, alt. 1200-3000 m and Meghalaya eastwards, alt. 1200-1800 m.

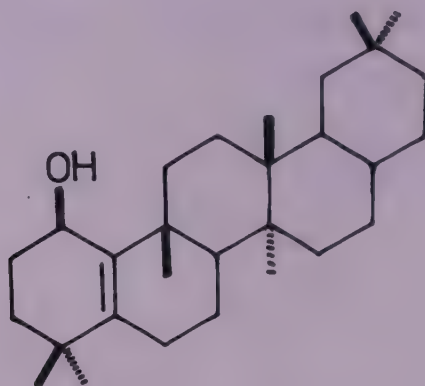
ANCHUSA (Boraginaceae)

A. sikkimensis Clarke; see *Microula sikkimensis* (Clarke) Hemsl.

ANDRACHNE (Euphorbiaceae)

A. cordifolia Muell.-Arg. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 41).

New triterpene - glut-5(10)-en-1 β -ol - from aerial parts and roots (*Phytochemistry* 1986, 25, 2669); isolation of glut-5(10)-en-3-one from aerial parts and roots and its structure elucidation (*Phytochemistry* 1987, 26, 1539).

NEW COMPOUNDS

Glut-5(10)-en-1 β -ol

ANDROGRAPHIS (Acanthaceae)

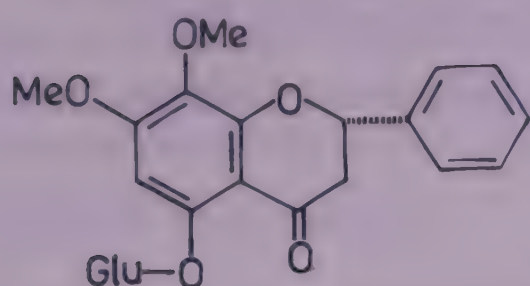
A. paniculata (Burm.) Wall. ex Nees (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 41).

Total root flavonoids effective against experimental myocardial ischemic necrosis induced by isoprenaline in rats and by ligation of left descending coronary artery in rabbits; decreased infarction size, and pathological changes in ST segment and Q wave inhibited; LD50 of flavonoids in mice, 1.15 g/kg, i.v. (*Zhongcaoyao* 1987, 18, 315; *Chem. Abstr.* 1987, 107, 168534 d).

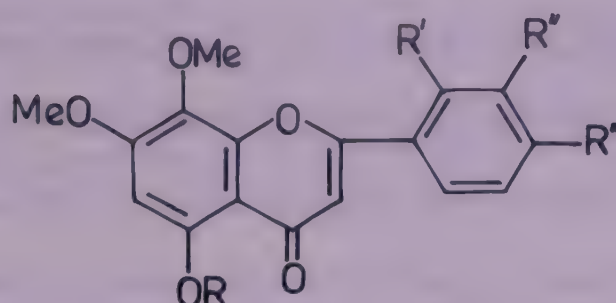
Andrographolide (5.0 mg/kg and 10.0 mg/kg) or single dose of leaf extract (0.5 g/kg and 1.0 g/kg) given orally to adult male rats produced dose-related and time-dependent characteristic activation of brush-border membrane-bound hydrolases, lactase, maltase and sucrase in duodenum, jejunum and ileum (*Methods Find. Exp. Clin. Pharmacol.* 1985, 7, 617; *Chem. Abstr.* 1986, 104, 19911 s).

Paniculides A, B and C isolated from callus culture (*Chem. Commun.* 1968, 1493; *J. Exp. Bot.* 1971, 22, 314); synthesis of paniculide A (*Tetrahedron* 1987, 43, 5475); synthesis of paniculides B and C (*J. Chem. Soc. Perkin 1* 1985, 1509); new flavanone glucoside - andrographidine A - and new flavone glucosides - andrographidines B, C, D, E and F - isolated from roots and characterised (*Chem. Pharm. Bull.* 1987, 35, 4429); NMR and ¹³C-NMR spectra of andrographolide (*Fitoterapia* 1988, 59, 501).

NEW COMPOUNDS



Andrographidine A



Andrographidine B

$R, R''' = H, R' = OH, R'' = O-Glu$

Andrographidine C

$R = Glu, R', R'', R''' = H$

Andrographidine D

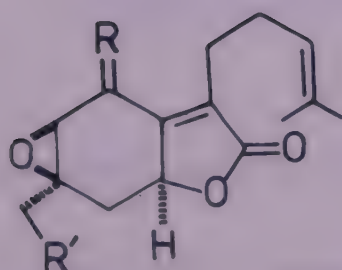
$R = Glu, R', R'' = OMe, R''' = H$

Andrographidine E

$R = Glu, R' = OMe, R'', R''' = H$

Andrographidine F

$R = Glu, R', R'' = OMe, R''' = OH$



Paniculide A

$R = \beta-OH, H, R' = H$

Paniculide B

$R = \beta-OH, H, R' = OH$

Paniculide C

$R = O, R' = OH$

ANDROPOGON (Poaceae)

A. citratus DC.; see *Cymbopogon citratus* (DC.) Stapf

A. distans Nees ex Steud.; see *Cymbopogon distans* (Nees ex Steud.) Wats.

A. jwarancusa Jones; see *Cymbopogon jwarancusa* (Jones) Schult.

A. khasianus Munro ex Duthie; see *Cymbopogon khasianus* (Hack.) Stapf ex Bor

A. nardus L.; see *Cymbopogon nardus* (L.) Rendle

A. nardus L. var. *flexuosus* (Nees ex Steud.) Hack.; see *Cymbopogon flexuosus* (Nees ex Steud.) Wats.

A. nardus L. var. *stracheyi* Hook.f.; see *Cymbopogon pospischilii* (K. Schum.) Hubbard

A. pendulus Nees ex Steud.; see *Cymbopogon pendulus* (Nees ex Steud.) Wats.

A. schoenanthus L. var. *martinii* Hook.f.; see *Cymbopogon martinii* (Roxb.) Wats.

A. sorghum Brot.; see *Sorghum bicolor* (L.) Moench

A. squarrosus L.f.; see *Vetiveria zizanioides* (L.) Nash

ANDROSACE (Primulaceae)

A. saxifragifolia Bunge; see *Primula umbellata* (Lour.) Bentvelzen

ANEILEMA (Commelinaceae)

A. triquetrum Wall. ex Clarke; see *Murdannia triquetra* (Wall. ex Clarke) Bruckn.

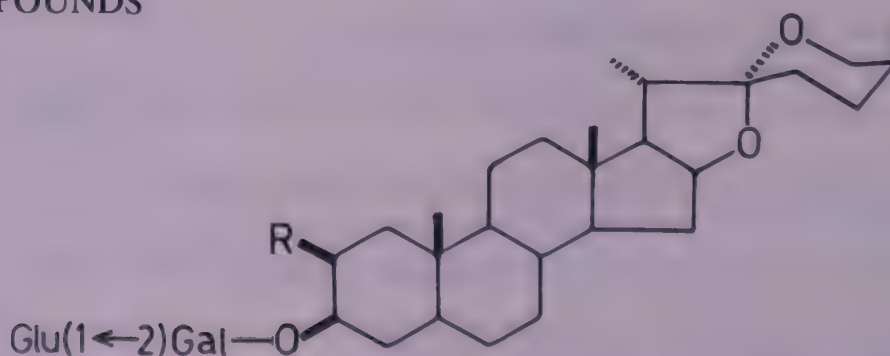
ANEMARRHENA (Liliaceae)

A. asphodeloides Bunge (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 47).

Methanolic extract of rhizomes exhibited marked hypoglycaemic activity in mice (*Planta Med.* 1985, 51, 100); rhizome extract inhibited ADP-induced aggregation of rabbit and human platelets (*Yakugaku Zasshi* 1988, 108, 555; *Chem. Abstr.* 1988, 109, 183231 n).

An improved method for extraction of sarsasapogenin (*Zhongyao Tongbao* 1983, 10, 133; *Chem. Abstr.* 1985, 103, 92689 c); four glycans - anamerans A, B, C and D - isolated from rhizomes (*Planta Med.* 1985, 51, 100); isolation and structure elucidation of two active compounds - tiomosaponin A III and markogenin-3-O- β -glucopyranosyl(1 \rightarrow 2)- β -D-galactopyranoside (I) - from rhizomes (*Yakugaku Zasshi* 1988, 108, 555; *Chem. Abstr.* 1988, 109, 183231 n).

NEW COMPOUNDS



Tiomosaponin A III

R = H

I

R = OH

BIOLOGICAL ACTIVITY

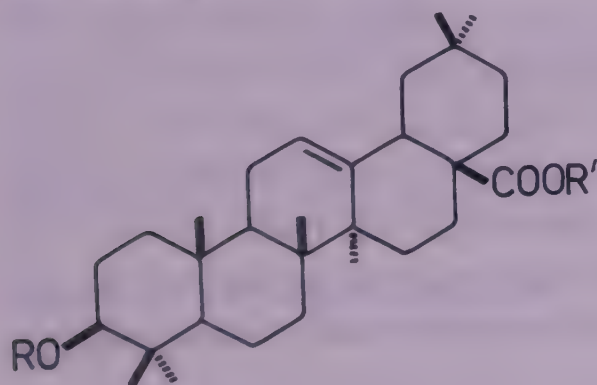
Anamerans A, B, C and D exhibited hypoglycaemic activity in normal and aloxan-induced hyperglycaemic mice (*Planta Med.* 1985, 51, 100); tiomosaponin A III and I inhibited ADP-induced aggregation as well as 5-HT or arachidonic acid-induced aggregation of human platelets (*Yakugaku Zasshi* 1988, 108, 555; *Chem. Abstr.* 1988, 109, 183231 n).

ANEMONE (Ranunculaceae)

A. rivularis Buch.-Ham. ex DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 47).

Four new oleanane saponins - huzhangosides A, B, C and D - isolated from roots and their structures determined (*Planta Med.* 1984, 50, 327).

NEW COMPOUNDS



Huzhangoside A

R = Xyl(3→1)Rha(2→1)Ribose, R' = H

Huzhangoside B

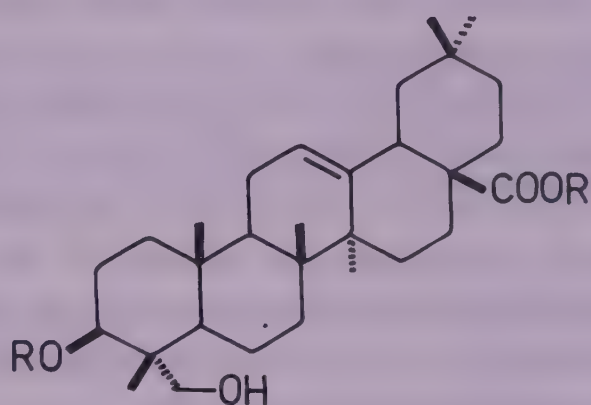
R = Ara(2→1)Rha(3→1)Ribose,

R' = Glu(6→1)Glu(4→1)Rha

Huzhangoside C

R = Xyl(2→1)Rha(3→1)Ribose,

R' = Glu(6→1)Glu(4→1)Rha



Huzhangoside D

R = Ara(2→1)Rha(3→1)Ribose,

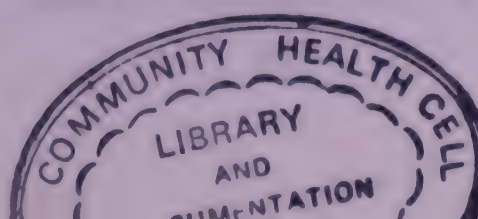
R' = Glu(6→1)Glu(4→1)Rha

ANETHUM (Apiaceae)

A. graveolens L. syn. *A. sowa* Roxb. ex Flem., *Peucedanum graveolens* (L.) Benth. & Hook.f., *P. sowa* Kurz (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 44).

Isolation of (+)carvone from seed oil (*Indian Perfum.* 1985, 29, 161; *Chem. Abstr.* 1986, 105, 11832 k); piperine, β -sitosterol and its glucoside from seeds (*Indian J. Chem.* 1986, 25B, 979); isolation of optically pure (S)(+)carvone from essential oil of fruits (*Flavour Fragrance J.* 1987, 2, 95; *Chem. Abstr.* 1988, 109, 20290 s).

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A. sowa Roxb. ex Flem.; see *A. graveolens* L.

ANGELICA (Apiaceae)

A. glauca Edgew. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 46).

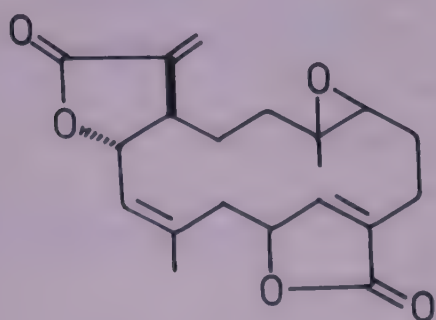
Isolation of new furocoumarin - 2''-O-acetyloxypeucedanin hydrate - from roots along with archangelin and oxypeucedanin and its characterisation (*Indian J. Chem.* 1989, 28B, 95).

ANISOMELES (Lamiaceae)

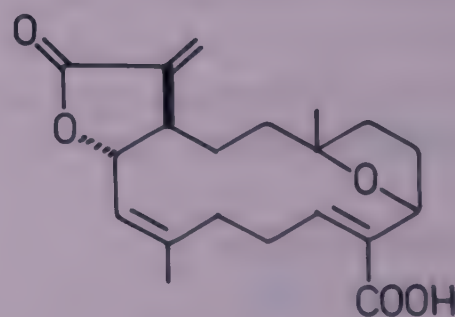
A. indica (L.) Kuntze syn. *A. ovata* R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 47).

n-Hentriacontane, glutinone, glutinol, friedelin, ovatodiolide, anisomelic acid, betulin, methyl p-hydroxycinnamate, β -sitosterol and its glucoside from aerial parts (*J. Nat. Prod.* 1984, 47, 1052); ovatodiolide and four related macrocyclic diterpenoids (I, II, III and IV) isolated and characterised (*Wakan Iyaku Gakkaishi* 1985, 2, 664; *Chem. Abstr.* 1986, 105, 90874 b; *Planta Med.* 1986, 52, 297); isolation of cosmosiin hydrate, cosmosiin, terniflorin, prunin, prunin-6''-p-coumarate and prunin-3'',6''-di-p-coumarate (*J. Nat. Prod.* 1985, 48, 150); n-hexacosane, n-hexacosanol, β -amyrin, ovatodiolide, anisomelic acid isolated from unsaponifiable fraction of stem whereas saponifiable fraction contained stearic, palmitic and lignoceric acids (*Fitoterapia* 1988, 59, 155).

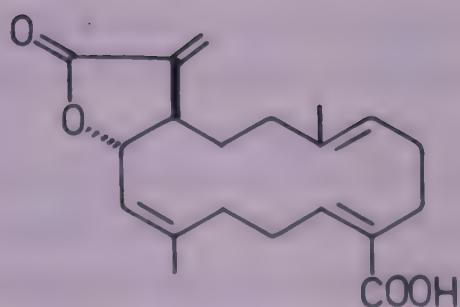
NEW COMPOUNDS



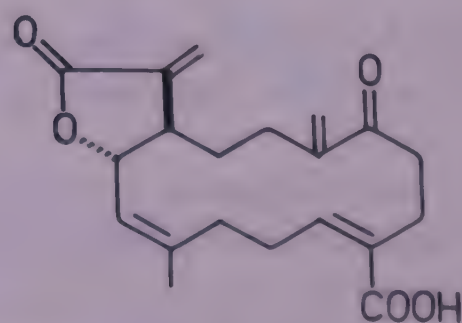
I



II



III



IV

BIOLOGICAL ACTIVITY

Ovatodiolide and diterpenoids I-IV were strongly cytotoxic to cultured KB cells, ovatodiolide being the most active with IC₅₀, 0.5 µg/ml (*Wakan Iyaku Gakkaishi* 1985, 2, 664; *Chem. Abstr.* 1986, 105, 90874 b; *Planta Med.* 1986, 52, 297); ovatodiolide concentration-dependently inhibited contractility and Ca²⁺ current of isolated frog heart and produced transient hypotensive effect in dogs but did not inhibit angiotensin-converting enzyme (*Wakan Iyaku Gakkaishi* 1985, 2, 664; *Chem. Abstr.* 1986, 105, 90874 b).

A. ovata R.Br.; see *A. indica* (L.) Kuntze

ANNONA (Annonaceae)

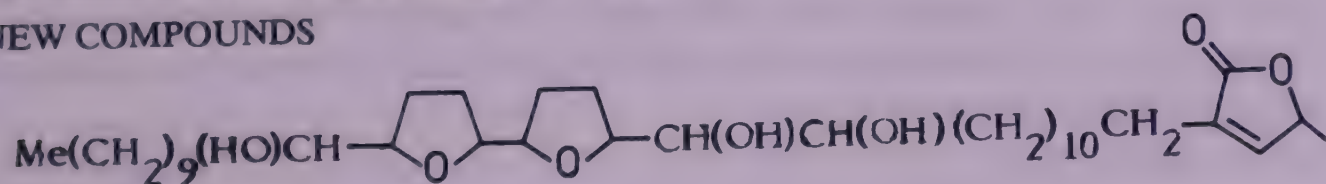
A. cherimolia Mill. (*cherimola*) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 48).

Isolation of rutoside, isoquercitroside and quercetin from leaves (*Plant. Med. Phytother.* 1984, 18, 233; *Chem. Abstr.* 1985, 102, 201207); (+)isoboldine, (-)stepholidine, (+)corytuberine, (+)nornantine, (+)reticuline, (-)anonaine, liriodenine and lanuginosine isolated from leaves (*J. Nat. Prod.* 1985, 48, 151).

A. reticulata L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 49).

Isolation of 14-hydroxy-25-deoxyrollinacin from stem bark and its structure elucidation (*J. Nat. Prod.* 1986, 49, 648); oxoushinsunine, anonaine, michelalbine, reticuline, asimilobine, 3-hydroxynornuciferine, annomontine, methoxyannomontine from root and stem bark (*Taiwan Yao Hsueh Tsa Chih* 1987, 195; *Chem. Abstr.* 1988, 109, 107699 f); fruits yielded kaur-16-en-19-oic acid whereas elemol, α-eudesmol and δ-cadinol obtained from leaves (*Fitoterapia* 1987, 58, 411); caryophyllene-4,5-oxide, methyl (-)17-hydroxy-16β-kauran-19-oate and its 16α isomer from stem bark (*J. Nat. Prod.* 1987, 50, 979).

NEW COMPOUNDS



14-Hydroxy-25-deoxyrollinacin

BIOLOGICAL ACTIVITY

Kaur-16-en-19-oic acid showed antibacterial activity but was inactive against fungi (*Fitoterapia* 1987, 58, 411).

A. squamosa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 49).

Higenamine synthesised (*Arch. Pharmacol Res.* 1984, 7, 133; *Chem. Abstr.* 1985, 103, 22814 r); kaurenoic acid, β -sitosterol and phenolic and non-phenolic alkaloids present in bark (*Indian J. Nat. Prod.* 1986, 2(2), 8; *Chem. Abstr.* 1987, 107, 74258 q); hyperoside, rutin and quercetin from leaves (*Fitoterapia* 1986, 57, 198); isolation of n-hexacosanol, n-octacosanol, n-triacontanol, 16-hentriacontanone, campesterol, stigmasterol and β -sitosterol from leaves (*J. Indian Chem. Soc.* 1986, 63, 255).

ANOGEISSUS (Combretaceae)

A. latifolia (Roxb. ex DC.) Wall. ex Guill. & Perr. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 50).

Pharmacognostic studies of stem bark and roots (*Proc. Indian Acad. Sci., Plant Sci.* 1985, 94, 589).

Quercetin-3-O- β -D-galactopyranosyl(1 \rightarrow 4)-O- α -L-rhamnopyranoside isolated from roots (*J. Indian Chem. Soc.* 1985, 62, 76).

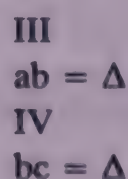
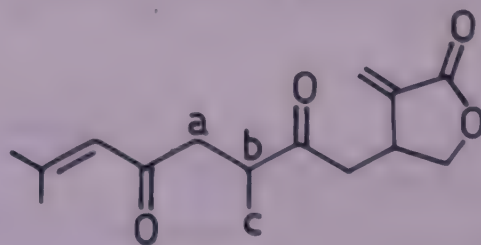
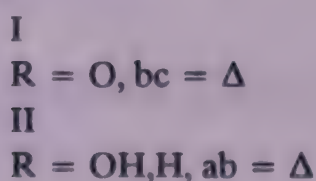
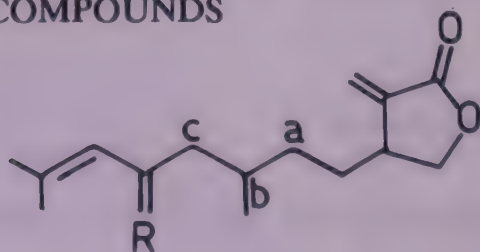
Note : Author citation given in this volume is more appropriate and should be read for this taxon in Volumes 1, 2 and 3.

ANTHEMIS (Asteraceae)

A. cotula L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 37).

Determination of calarene (30.52), farnesene (20.91), farnesol (15.28), α -pinene (0.16), β -pinene (0.30), camphene (0.35), α -phellandrene (0.46), α -terpineol (0.86), borneol (2.16), nerol (1.08), bornyl acetate (1.13), caryophyllene (1.52) and nerolidol (0.22%) in oil (*Essenze Deriv. Agrum* 1985, 55, 48; *Chem. Abstr.* 1986, 105, 66224 u); new sesquiterpene lactones - 6,7(Z)-dehydro-5,6-dihydroanthecotuloide (I), 8-O-dihydroanthecotuloide (II), 5-oxo-6,7(Z)-dehydro-5,6-dihydroanthecotuloide (III) and 5-oxo-6,13-dehydro-5,6-dihydroanthecotuloide (IV) - isolated along with phytol, taraxasterol, sitosterol, stigmasterol, 7-methoxy-6-acetyl-2,2-dimethylchromene and anthecotuloide; structures of new compounds elucidated (*Planta Med.* 1985, 51, 531).

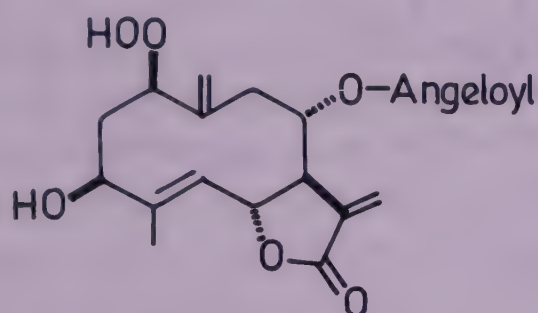
NEW COMPOUNDS



A. nobilis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 50).

New sesquiterpenoid peroxide - 1 β -hydroperoxyisonobiline - from flowers and its structure determination (*Arch. Pharm.* 1987, 320, 318; *Chem. Abstr.* 1988, 108, 91656 f); identification of angelic acid derivatives in essential oil by GC-MS (*Koryo* 1989, 161, 93; *Chem. Abstr.* 1989, 111, 45024 n).

NEW COMPOUNDS



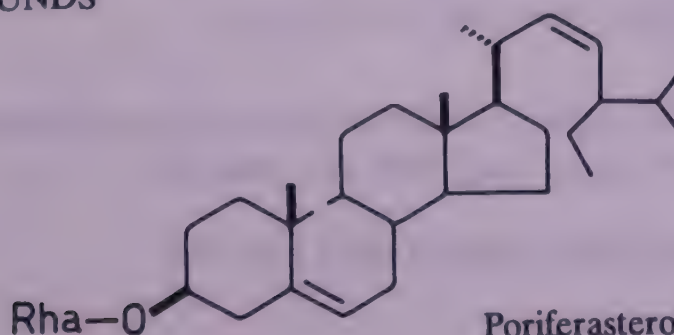
1 β -Hydroxyperoxyisonobiline

APHANAMIXIS (Meliaceae)

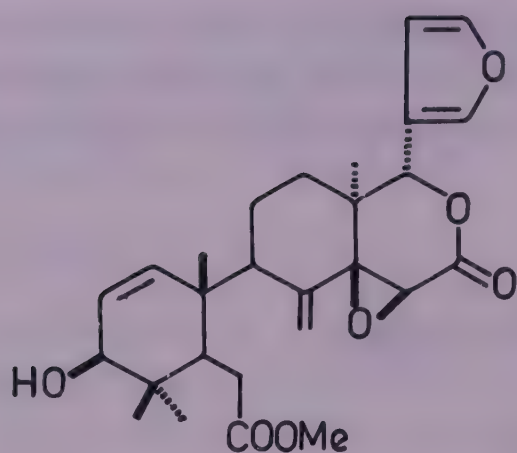
A. polystachya (Wall.) Parker syn. *Amoora rohituka* W. & A. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 53).

A new saponin isolated from stem bark and characterised as dammar-20(21)-en-24,25-epoxy-3 β -O- α -L-rhamnopyranosyl(1 \rightarrow 4)- β -D-xylopyranoside (I); β -sitosterol and stigmasterol also isolated (*Curr. Sci.* 1984, 53, 1288; *Natl. Acad. Sci. Lett.* 1984, 7, 213); new terpenoid glycoside - betulin-3 β -O-D-xylopyranoside - isolated from roots and its structure determined (*Indian J. Pharm. Sci.* 1984, 46, 161); new triterpene - aphananin - from fruits (*Phytochemistry* 1985, 24, 2123); isolation of 8C-methylquercetin-3-O- β -D-xylopyranoside from roots (*J. Nat. Prod.* 1985, 48, 299); two new glycosides isolated from stem bark and characterised as 1,5-dihydroxy-6,7,8-trimethoxy-2-methylantraquinone-3-O- β -D-xylopyranoside and 7,4'-O-dimethylnaringenin-5-O- α -L-rhamnopyranoside (*Curr. Sci.* 1985, 54, 38); amoorinin, a new limonoid, isolated from stem bark and characterised (*Planta Med.* 1987, 53, 298; *Curr. Sci.* 1987, 56, 770); a new saponin - poriferasterol-3-O- α -L-rhamnopyranoside - from stem bark and its structure elucidation (*Indian J. Pharm. Sci.* 1987, 49, 149).

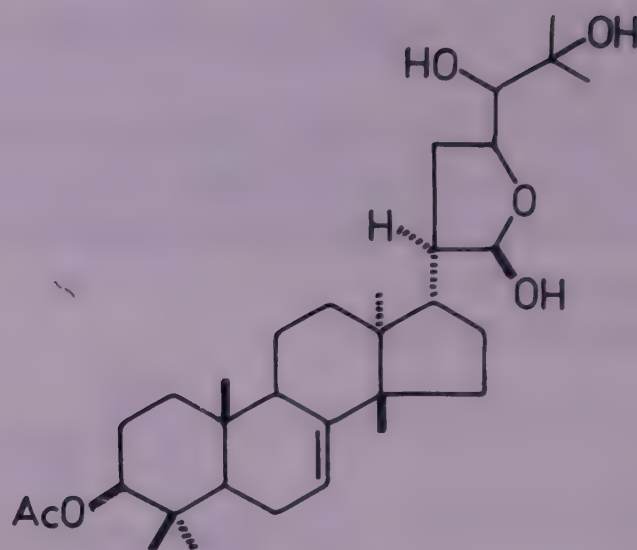
NEW COMPOUNDS



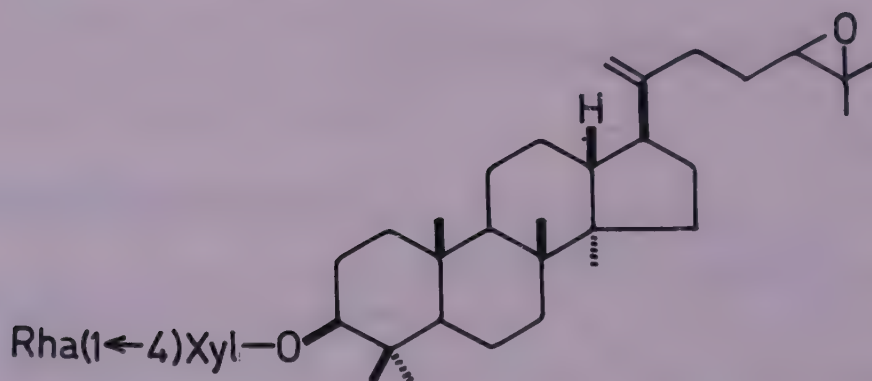
Poriferasterol-3-O- α -L-rhamnoside



Amoorinin



Aphananin



I

APIUM (Apiaceae)

A. graveolens L. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 54).

Isolation of 3-n-butylphthalide and 3-n-butyl-4,5-dihydrophthalide from seeds (*Yaouxue Tongbao* 1984, 19, 670; *Chem. Abstr.* 1985, 103, 92687 a); choline ascorbate from leaves (*J. Nat. Prod.* 1985, 48, 495); seselin, bergapten, rutaretin, celereoin, celeroside, apiumoside, vallein and nodakenin from seeds (*Planta Med.* 1986, 52, 246); octane-4,5-dione, 2-isopropoxyethane, sabinyl acetate and 1,4-butanediol detected in leaves (*Izv. Akad. Nauk Mold. SSR, Ser. Biol. Khim. Nauk* 1987, 24; *Chem. Abstr.* 1987, 107, 93510 g).

BIOLOGICAL ACTIVITY

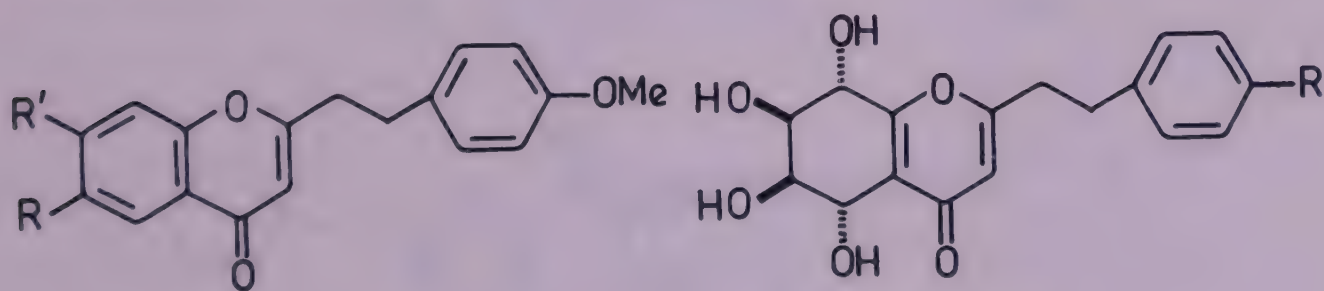
3-n-Butylphthalide and 3-n-butyl-4,5-dihydrophthalide exhibited anticonvulsant activity (*Yaouxue Tongbao* 1984, 19, 670; *Chem. Abstr.* 1985, 103, 92687 a).

A. petroselinum L.; see *Petroselinum crispum* (Mill.) A.W. Hill

AQUILARIA (Thymelaeaceae)

A. agallocha Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 55).

Isolation of a new chromone - 2-[2(4'-methoxyphenyl)ethyl]chromone (I) (*Chem. Pharm. Bull.* 1985, 33, 5088; *J. Nat. Prod.* 1986, 49, 1106); another chromone - 6-methoxy-2[2(4'-methoxyphenyl)ethyl]chromone (II) isolated and characterised by ¹³C-NMR spectroscopy (*J. Nat. Prod.* 1986, 49, 1106); new chromones - AH1, AH2, AH3, AH4, AH5 and AH6 - isolated, structure of AH1 found to be same as that of agarotetrol, isolated earlier (*Tetrahedron Lett.* 1978, 3921); AH2 assigned structure (5S,6R,7R,8S)-2-(2-phenylethyl)-5e',6e,7e,8e'-tetrahydroxy-5,6,7,8-tetrahydrochromone on basis of NMR and CD studies and named isoagarotetrol; AH3, AH4, AH5 and AH6 characterised as 6-hydroxy-2(2-phenylethyl)chromone, 6-methoxy-2(2-phenylethyl)chromone, 6-methoxy-2[2-(3'-methoxy-phenyl)ethyl]chromone and 6,7-dimethoxy-2-(2-phenylethyl)chromone respectively (*Chem. Pharm. Bull.* 1982, 30, 3791; *ibid.* 1986, 34, 2766); a new phenylethylchromone - AH1A - separated as acetyl derivative from crude AH1 whereas two other chromones - AH2a and AH2b - obtained from crude AH2 (*Chem. Pharm. Bull.* 1986, 34, 3033); isolation and characterisation of new biphenylethyl chromones - AH10 and AH11 (*Chem. Pharm. Bull.* 1986, 34, 4889); structure elucidation of new bi- and triphenylethylchromones - AH15 and AH18 - (*Chem. Pharm. Bull.* 1987, 35, 4680); further new chromones - AH7, AH8 and AH9 - from agar wood and their characterisation (*Chem. Pharm. Bull.* 1988, 36, 2417); isolation and structure elucidation of AH12, AH13 and AH14 (*Chem. Pharm. Bull.* 1989, 37, 124).

NEW COMPOUNDS

I

R,R' = H

II

R = OMe, R' = H

AH8

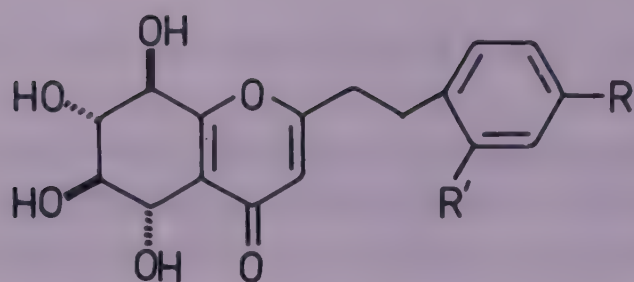
R,R' = OMe

Agarotetrol

R = H

AH1A

R = OMe



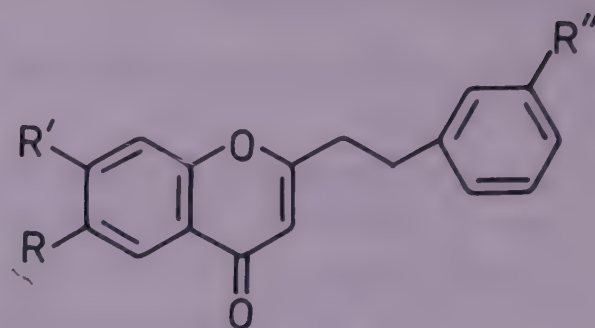
Isoagarotetrol

 $R, R' = H$

AH2a

 $R = OMe, R' = H$

AH2b

 $R = H, R' = OH$ 

AH3

 $R = OH, R', R'' = H$

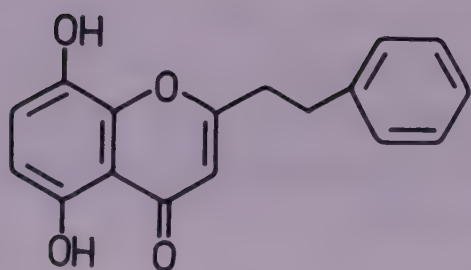
AH4

 $R = OMe, R', R'' = H$

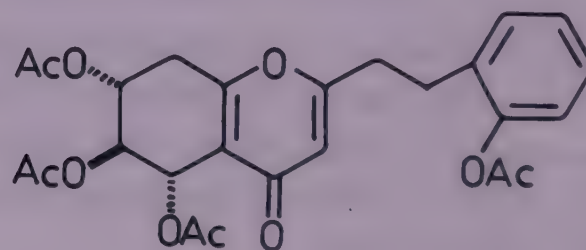
AH5

 $R, R'' = OMe, R' = H$

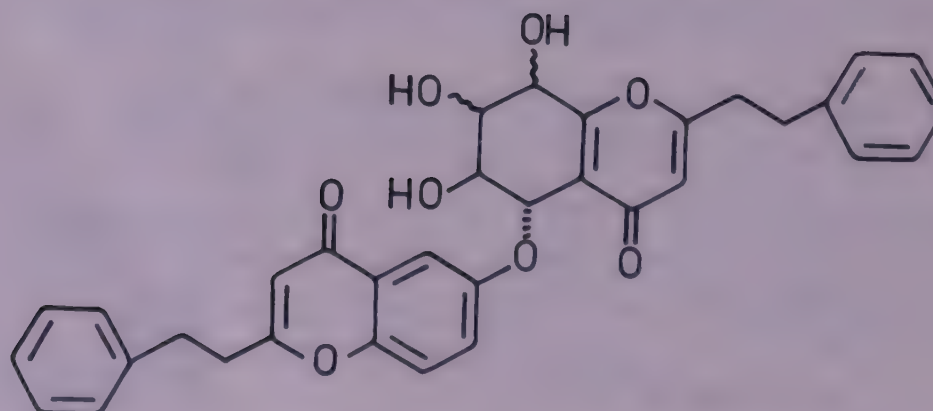
AH6

 $R, R' = OMe, R'' = H$ 

AH7



AH9

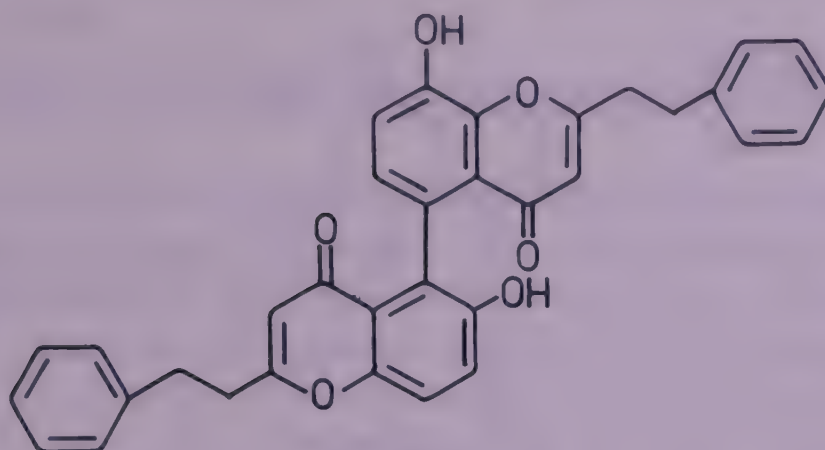


AH10 [5S,6S,7R,8S]

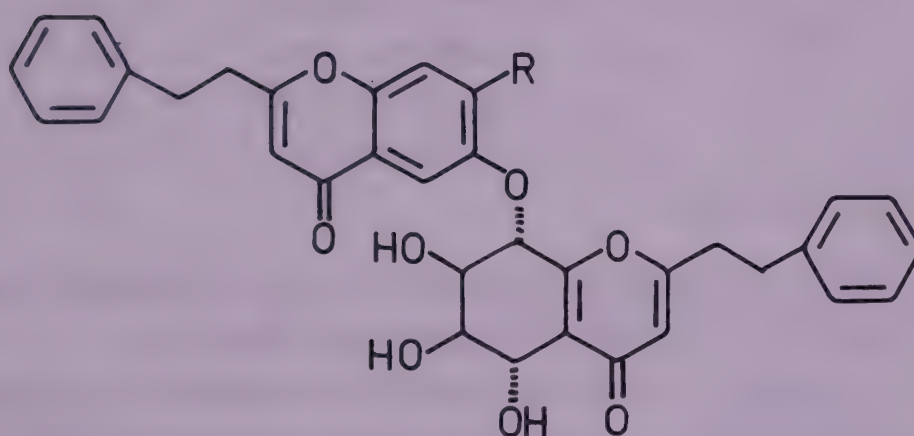
 $7 \sim = 7\beta, 8 \sim = 8\alpha$

AH14 [5S,6S,7S,8R]

 $7 \sim = 7\alpha, 8 \sim = 8\beta$



AH11

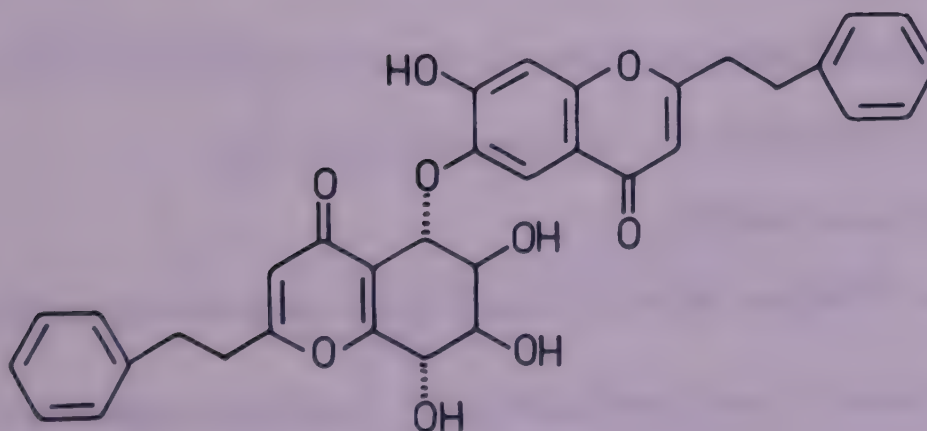


AH12 [5S,6R,7R,8S]

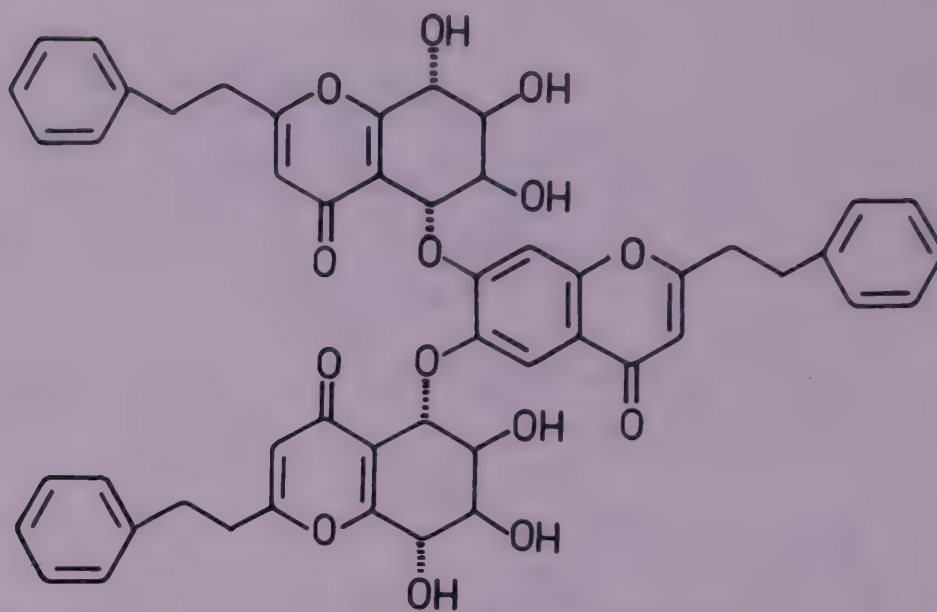
R = OMe

AH13 [5S,6R,7R,8S]

R = H,



AH15



AH18

ARABIDOPSIS (Brassicaceae)

A. thaliana (L.) Heynh. syn. *Sisymbrium thalianum* (L.) Gay & Monnard (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 22).

Isolation of octacosane, n-triacontanol, β -sitosterol, kaempferol, 3,4'-dimethyl-kaempferol, kaempferol-3-O-glucoside and apigenin (*Pharmazie* 1985, 40, 365; *Chem. Abstr.* 1985, 103, 85138 u).

ARALIA (Araliaceae)

A. bipinnatifida (Seem.) Clarke; see *Panax pseudoginseng* Wall. ssp. *himalaicus* Hara var. *bipinnatifidus* (Seem.) Li

A. pseudoginseng (Wall.) Benth. ex Clarke; see *Panax pseudoginseng* Wall. ssp. *pseudoginseng*

A. quinquefolia Decne. & Planch.; see *Panax ginseng* C.A. Mey.

ARAUCARIA (Araucariaceae)

A. imbricata Pav. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 63).

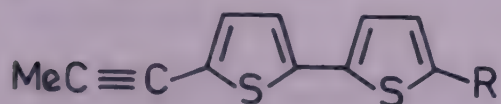
Leaves afforded 7-O-methylagathisflavone, 7''-O-methylamentoflavone, 7,7''-di-O-methylcupressuflavone, di-O-methylagathisflavone, di-O-methylamentoflavone, tri-O-methylagathisflavone, tri-O-methylamentoflavone and tri-O-methylcupressuflavone (*J. Nat. Prod.* 1987, 50, 332).

Note : Currently accepted name of this taxon is *A. araucana* (Molina) Koch.

ARCTIUM (Asteraceae)

A. lappa L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 64).

Mixtures of (4E,6E,12E)4,6,12-tetradecatrien-8,10-diyn-1,3-diyl diacetate and (4E,6Z,12E)4,6,12-tetradecatrien-8,10-diyn-1,3-diyl diacetate (2:1), and of (4E,6E)4,6-tetradecadien-8,10,12-triyn-1,3-diyl diacetate and (4E,6Z)4,6-tetradecadien-8,12-triyn-1,3-diyl diacetate (5:2), as well as 11(E)1,11-tridecadien-3,5,7,9-tetrayne, (3E,11E)1,3,11-tridecatrien-5,7,9-triyn-3(E)-tridecen-5,7,9,11-tetrayne-1,2-epoxide and (8Z,15Z)heptadeca-1,8,15-trien-11,13-diyne isolated from roots (*Nippon Nogei Kagaku Kaishi* 1986, 60, 377; *Chem. Abstr.* 1986, 105, 111980 a); new 5'-(1-propynyl)-2,2'-bithienyl-5-yl derivatives - arctinone a and its acetate, arctinone b, arctinols a and b, arctinal, arctic acid b, arctic acid c and methyl arctate b - isolated and characterised (*Agric. Biol. Chem.* 1986, 50, 263); synthesis of arctic acid, arctinone b and methyl arctate b (*Agric. Biol. Chem.* 1986, 50, 565); two new guaianolides - lappaphen a and lappaphen b - isolated and their structures determined (*Agric. Biol. Chem.* 1987, 51, 1475).

NEW COMPOUNDS

Arctinol a

R = CH₂OH

Arctinol b

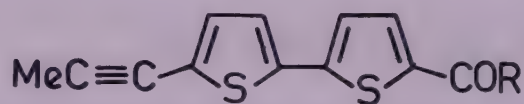
R = CH(OH)CH₂OH

Arctinal

R = CHO

Arctic acid c

R = CH(OH)COOH



Arctinone a

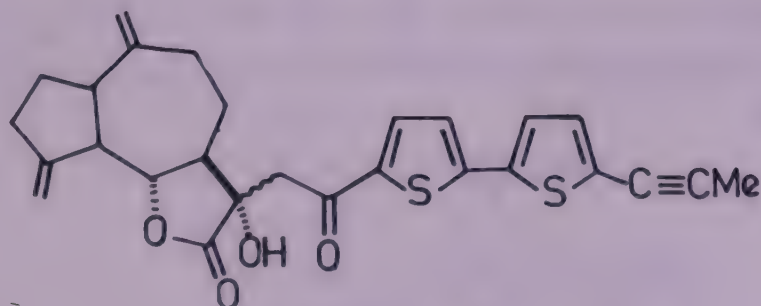
R = CH₂OH

Arctinone b

R = Me

Arctic acid b

R = COOH



Lappaphen a

~ = β

Lappaphen b

~ = α

BIOLOGICAL ACITIVITY

Trachelogenin exhibited Ca^{2+} antagonist activity, its IC_{50} and PA_2 being $1.1 \mu\text{M}$ and $6.60 \mu\text{M}$ respectively; it exhibited long-lasting antihypertensive effect in spontaneously hypertensive rats (*Chem. Pharm. Bull.* 1986, 34, 3514).

ARCTOSTAPHYLOS (Ericaceae)

A. uva-ursi Spreng. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 57).

Ethyl β -D-erythro-D-glycero-hexopyranos-3-uloside isolated from roots (*Pharmazie* 1986, 41, 526; *Chem. Abstr.* 1986, 105, 187616 g); ursolic acid, uvaol, α - and β -amyrins, oleanolic acid, lupeol, betulinic acid and β -sitosterol from roots (*Pharmazie* 1988, 43, 442; *Chem. Abstr.* 1988, 109, 146355 k).

ARDISIA (Myrsinaceae)

A. floribunda Wall.; see *A. thyrsoflora* D.Don

A. humilis Vahl; see *A. solanacea* Roxb.

A. neriifolia Wall. ex DC.; see *A. thyrsoflora* D.Don

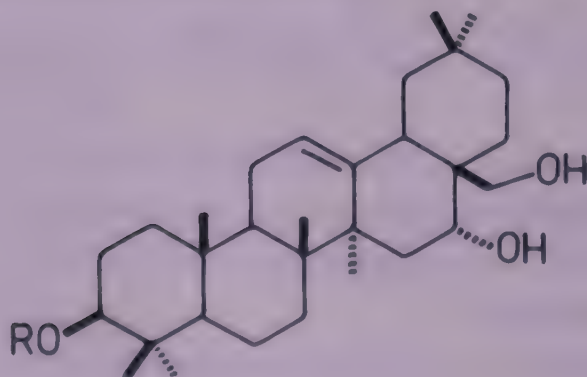
A. solanacea Roxb. syn. *A. humilis* auct. (non Vahl) p.p. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 67).

Alcoholic extract exhibited significant activity against most of the tested Gram-positive and Gram-negative microorganisms (*Fitoterapia* 1987, 58, 357).

A. thyrsoflora D.Don syn. *A. neriifolia* Wall. ex DC., *A. floribunda* Wall. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 58).

Two new flavones isolated and characterised as 5,6,3',4'-tetramethoxyflavone and 5,6,2',3',4'-pentamethoxyflavone (*Indian J. Chem.* 1987, 26B, 894); two new spermicidal saponins - ardisiosides A and B - isolated and their structures determined (*Indian J. Chem.* 1989, 28B, 522).

NEW COMPOUNDS



Ardisioside A

R = Rha(4→1)Gal

Ardisioside B

R = Rha(4→1)Ara(2→1)Gal

ARECA (Arecaceae)

A. catechu L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 58).

Four bioactive polyphenolic components - NPF-861A, NPF-861B, NPF-8611A and NPF-8611B - isolated from seeds (*Planta Med.* 1988, 54, 419, 422).

BIOLOGICAL ACTIVITY

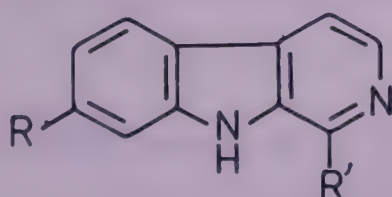
Areca II-5-C, a tannin from seeds, inhibited angiotensin- converting enzyme *in vitro*; its oral administration produced lasting dose-related antihypertensive effect in spontaneously hypertensive rats and the responses obtained with doses of 0.1 and 0.2 g/kg were comparable to those with 0.03 and 0.1 g/kg captopril. Areca II-5-C i.v. at 10.0 and 15.0 mg/kg produced rapid and marked reduction in blood pressure in spontaneously hypertensive rats and maximum antihypertensive effect at 15.0 mg/kg was about 5 times as large as that of captopril (*Life Sci.* 1986, 38, 1375); NPF-861A, NPF- 861B, NPF-8611A and NPF-8611B inhibited 5'-nucleotidase; they were also moderately cytotoxic to Ehrlich ascites carcinoma strain E, HeLa and HL-60 cells but inactive against L1210 cells both in *in vivo* and *in vitro* (*Planta Med.* 1988, 54, 419, 422).

ARENARIA (Caryophyllaceae)

A. kansuensis Maxim.

Four new alkaloids - arenarines A, B, C and D - isolated and their structures elucidated (*Chem. Pharm. Bull.* 1989, 37, 1808).

Distribution : Himalayas from Kumaon to Nepal, alt. 3900-5000 m.

NEW COMPOUNDS

Arenarine A

R = H, R' = COCH₂OMe

Arenarine B

R = H, R' = CH(OH)CH₂OMe

Arenarine C

R = OMe, R' = Ac

Arenarine D

R = OH, R' = Ac

ARGEMONE (Papaveraceae)

A. mexicana L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 59).

Aqueous extract of leaves exhibited anti-inflammatory activity (*Fitoterapia* 1984, 55, 352).

Identification of isorhamnetin-3-glucoside, β -amyrin, cysteine and phenylalanine in leaves (*Fitoterapia* 1984, 55, 352); synthesis of sanguinarine and chelerythrine (*Collect. Czech. Chem. Commun.* 1984, 49, 1412); isolation of norsanguinarine, berberine, protopine and β -sitosterol from roots, 3-methoxyquercetin and vanillic acid from flowers (*Pharmazie* 1985, 40, 202; *Chem. Abstr.* 1985, 103, 3753 d); berberine (0.1), chelerythrine (0.03), protopine (0.028), α -allocryptopine (0.02), sanguinarine (0.004) and coptisine (0.004%) present in Egyptian plant (*Egypt. J. Pharm. Sci.* 1986, 25, 1; *Chem. Abstr.* 1987, 106, 192799 u); tryptophan (28.1), methionine (13.2), proline (12.8), alanine (10.7), tyrosine (8.8), histidine (6.7), glycine (5.1), leucine (4.2), aspartic acid (1.3) and glutamic acid (0.8%) identified in aerial parts (*J. Indian Chem. Soc.* 1986, 63, 934); two new compounds - mexicanol and mexicanic acid - isolated and characterised as 6,11-triacontanediol and 10-hydroxyheptadec-cis-4-enoic acid respectively (*Chem. Ind.* 1987, 419); norsanguinarine, 6-acetonyldihydrosanguinarine, 6-acetonyldihydrochelerythrine, reticuline, thalifoline, acetonylreframidine and muramine isolated from Egyptian plant (*Egypt. J. Pharm. Sci.* 1988, 29, 53; *Chem. Abstr.* 1989, 110, 92084 w).

A. ochroleuca Sweet (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 68).

Protopine (21.0), allocryptopine (16.0), berberine (13.0), sanguinarine, cheilanthifoline, scoulerine and reticuline from flowering-fruitlet plant (*Khim. Prir. Soedin.* 1986, 798; *Chem. Abstr.* 1987, 106, 153122 y; *Khim.-Farm. Zh.* 1988, 22, 580; *Chem. Abstr.* 1988, 109, 61343 e).

ARGYREIA (Convolvulaceae)

A. cuneata (Willd.) Ker-Gawl. syn. *Rivea cuneata* Wight (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 23).

Linoleic (40.2), linolenic (6.6), oleic (12.9), palmitic (18.6), ricinoleic (10.0), stearic (8.1), malvalic (2.4), myristic (0.5) and sterculic (0.77%) acids identified in seed oil (*Chem. Ind.* 1987, 695).

A. nervosa (Burm.f.) Boj. syn. *A. speciosa* (L.f.) Sweet (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 68).

The oil exhibited moderate antiseptic activity against several Gram-positive and Gram-negative bacteria and phytopathogenic fungi.

Oleic acid identified as major component in oil (*Fitoterapia* 1985, 56, 357).

A. speciosa (L.f.) Sweet; see *A. nervosa* (Burm.f.) Boj.

ARISTEGA (Menispermaceae)

A. laevifolia Miers; see *Tiliacora triandra* (Colebr.) Diels

ARISTOLOCHIA (Aristolochiaceae)

A. bracteata Retz.; see *A. bracteolata* Lamk.

A. bracteolata Lamk. syn. *A. bracteata* Retz. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 43).

Isolation of N-acetylnornuciferine and aristololactam (*Planta Med.* 1988, 54, 467).

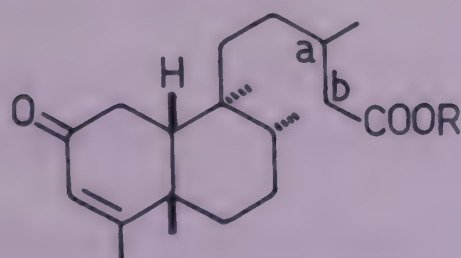
A. brasiliensis Mart. & Zucc.

Eng. - Bird's head, Birthwort; Bo. - Popatvel.

Six new clerodane derivatives - rel(5S,8R,9S,10R)2-oxo-ent-3-cleroden-15-oic acid (I), rel(5S,8R,9S,10R)2-oxo-ent-clerod-3,13-dien-15-oic acid methyl ester (II), (5R,8R,9S, 10R) ent-3-cleroden-15-oic acid (III), rel(5S,8R,9S,10R)ent-clerod-3,13-dien-15-oic acid (IV), (2S,5R,8R,9S,10R)2-hydroperoxy-ent-3-cleroden-15-oic acid methyl ester (V) and (2S,5R, 8R,9S,10R)2-hydroperoxyent-clerod-3,13-dien-15-oic acid methyl ester (VI) - isolated along with kolavenic acid, 2-oxokolavenic acid, methyl kolavenoate, methyl 2-oxokolavenoate, populifolic acid methyl ester and 2-oxopopulifolic acid methyl ester (*Phytochemistry* 1987, 26, 2781).

Distribution : Native to Brazil, introduced into Indian gardens.

NEW COMPOUNDS

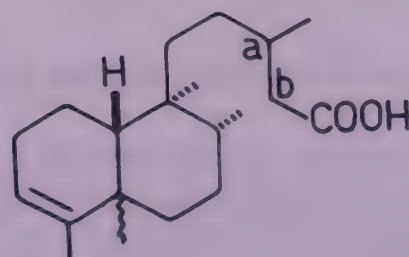


I

R = H

II

R = Me, ab = Δ

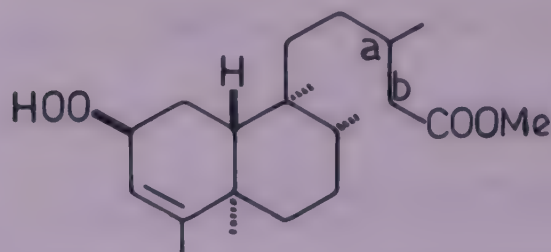


III

~ = α

IV

ab = Δ, ~ = β



V

VI

ab = Δ

A. indica L. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 59).

Synthesis of aristolindiquinone (*Tetrahedron* 1985, 41, 107); crystal structure determination of aristolindiquinone (*Acta Crystallogr., Cryst. Struct. Commun.* 1986, 42C, 1533; *Chem. Abstr.* 1987, 107, 39492 q); methyl nonacosen-12-oate isolated (*Indian J. Chem.* 1987, 26B, 86).

BIOLOGICAL ACTIVITY

Oral administration of aristolochic acid showed dose-dependent mutagenic activity in granuloma pouch assay (*Mutat. Res.* 1985, 143, 143; *Chem. Abstr.* 1985, 103, 81428 r); aristolic acid, a potent antifertility agent, was non-mutagenic in Ames' test whereas aristolochic acid and its analogs were mutagenic; presence of nitro group in phenanthrene nucleus essential for mutagenic action (*Indian J. Pharmacol.* 1987, 19, 26).

A. reticulata Nuttall. (Compend. Indian Med. Plants, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 44).

Stereo-selective total synthesis of aristolactone and epiaristolactone (*J. Org. Chem.* 1987, 52, 3883).

A. roxburghiana Klotz.; see *A. tagala* Cham.

A. tagala Cham. syn. *A. roxburghiana* Klotz. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 61).

Identification of 4,7-dimethyl-6-methoxy-1-tetralone in extract of leaves (*Zhongcaoyao* 1985, 15, 13; *Chem. Abstr.* 1986, 104, 106221 d).

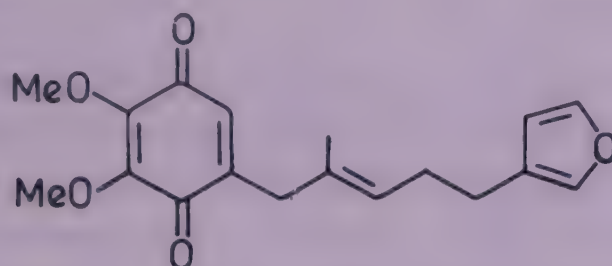
ARNEBIA (Boraginaceae)

A. euchroma (Royle) Johnston syn. *Macrotomia perennis* (Schrenk) Boiss. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 61).

Shikonin, deoxyshikonin, acetylshikonin, β,β -dimethylacrylshikonin, β,β -dimethylacrylalkanin, β -hydroxyisovalerylalkanin, β -hydroxyisovalerylshikonin, β -acetoxyisovalerylalkanin and teracrylshikonin isolated from roots (*Sepu* 1984, 1, 131; *Chem. Abstr.* 1985, 103, 59142 w;

Yaoxue Xuebao 1984, 19, 921; *Chem. Abstr.* 1985, 103, 11307 b); a new monoterpenyl benzoquinone - arnebifuranone - isolated and its structure elucidated (*Tetrahedron Lett.* 1984, 25, 5541).

NEW COMPOUNDS



Arnebifuranone

A. guttata Bunge var. *guttata* syn. *A. tibetana* Kurz (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 62).

Shikonin, deoxyshikonin, β,β -dimethylacrylshikonin, acetylshikonin, teracrylshikonin and β -hydroxyisovalerylshikonin isolated from roots (*Sepu* 1984, 1, 131; *Chem. Abstr.* 1985, 103, 59142 w).

A. hispidissima DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 62).

Synthesis of shikalkin (*Dokl. Akad. Nauk SSSR* 1987, 295, 614; *Chem. Abstr.* 1988, 109, 37669 v); vitexin isolated from flowers (*Pakistan J. Pharm. Sci.* 1988, 1, 19; *Chem. Abstr.* 1988, 109, 146300 p).

A. tibetana Kurz ; see *A. guttata* Bunge var. *guttata*

ARNICA (Asteraceae)

A. montana L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 63).

Eupatofolin, spinacetin, laciniatin, dillenetin, patuletin, isorhamnetin and chrysoeriol isolated (*Planta Med.* 1985, 51, 136); hispidulin-7-O- β -D-glucoside, isorhamnetin-3-O- β -D-glucoside, spinacetin-3-O- β -D-glucoside, 6-methoxykaempferol-3-O- β -D-glucoside, patuletin-3-O- β -D-glucoside and quercetin-3-O- β -D-(6''-O-acetyl)glucoside isolated from flowers (*Planta Med.* 1987, 53, 434); 3-O- β -D-glucuronides of quercetin, kaempferol, isorhamnetin, patuletin and 6-methoxykaempferol as well as tricin and 3,5,7-trihydroxy-6,3',4'-trimethoxyflavone identified in flowers (*Planta Med.* 1988, 54, 247).

BIOLOGICAL ACTIVITY

Hispidulin was 100-fold as potent as theophylline in inhibiting platelet aggregation triggered by adenosine-5'-monophosphate, arachidonic acid, paf-acether and collagen. At

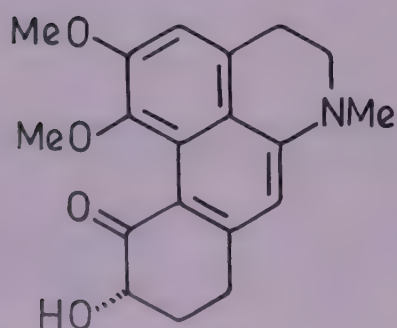
100.0 μ M it increased the control cAMP level in platelets 4-fold. Thus, hispidulin inhibits platelet aggregation by elevating cAMP level through a mechanism different from that of theophylline or PGE1 (*Eur. J. Pharmacol.* 1988, 147, 1).

ARTABOTRYS (Annonaceae)

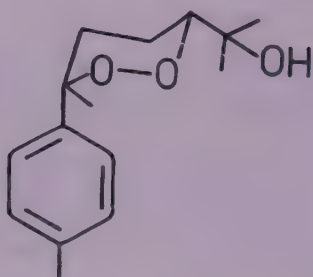
A. hexapetalus (L.f.) Bhandari syn. *A. odoratissimus* R.Br., *A. uncinatus* (Lamk.) Merrill (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 64).

24-Methylene-lanosta-7,9(11)-dien-3 β -ol isolated from stem bark (*J. Nat. Prod.* 1987, 50, 762); two new bisabolene derivatives - yingzhaosu C and yingzhaosu D - isolated and their structures determined (*Chem. Commun.* 1988, 523); a new 11-oxoaporphine alkaloid - artacinatine - isolated from stem and stem bark along with liriodenine and atherospermidine and its structure elucidated and confirmed by X-ray analysis (*Phytochemistry* 1989, 28, 2191).

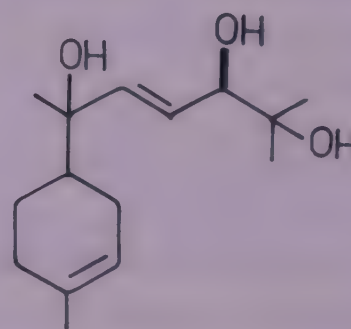
NEW COMPOUNDS



Artacinatine



Yingzhaosu C



Yingzhaosu D

A. odoratissimus R.Br.; see *A. hexapetalus* (L.f.) Bhandari

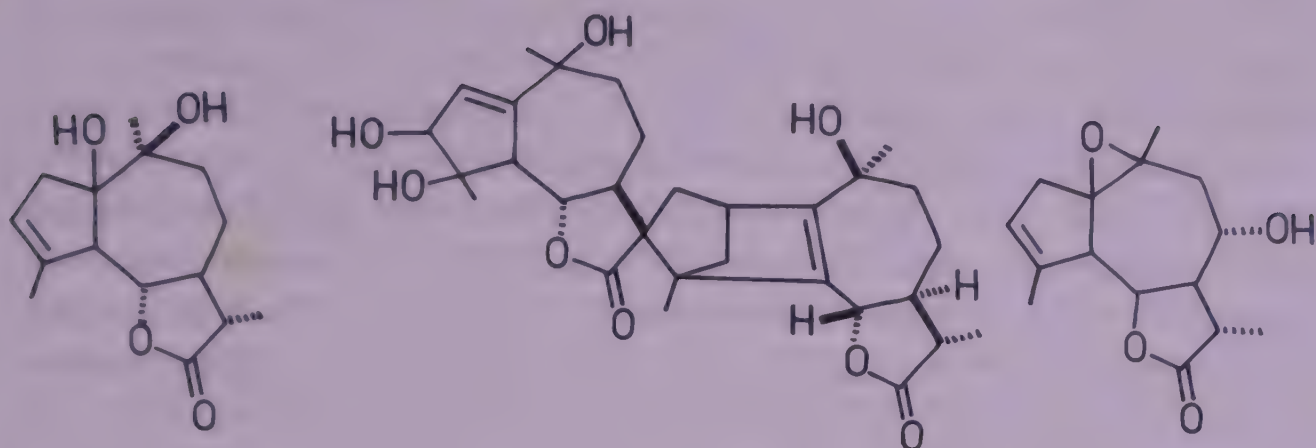
A. uncinatus (Lamk.) Merrill; see *A. hexapetalus* (L.f.) Bhandari

ARTEMISIA (Asteraceae)

A. absinthium L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 64).

Two new guaianolides - artanolide and deacetylglobicin - isolated from aerial parts and characterised (*Khim. Prir. Soedin.* 1984, 794; *Chem. Abstr.* 1985, 102, 146143 v); structure of absinthin confirmed by X-ray analysis (*Kristallografiya* 1985, 30, 682; *Chem. Abstr.* 1986, 105, 115241 h); scopoletin, umbelliferone, caffeoylquinic acid and chlorogenic acid isolated from infusion of plant (*Khim. Prir. Soedin.* 1987, 447; *Chem. Abstr.* 1987, 107, 140977 b); isolation of a new sesquiterpene lactone - artenolide - from foliage and its structure determination (*Khim. Prir. Soedin.* 1987, 667; *Chem. Abstr.* 1988, 108, 164684 a); parishin B and parishin C isolated from aerial parts (*Khim. Prir. Soedin.* 1987, 607; *Chem. Abstr.* 1988, 108, 34794 a); 24 ξ -ethylcholesta-7,22-dien-3 β -ol isolated (*Planta Med.* 1987, 53, 389).

NEW COMPOUNDS



Artanolide

Artenolide

Deacetylglobicin

BIOLOGICAL ACTIVITY

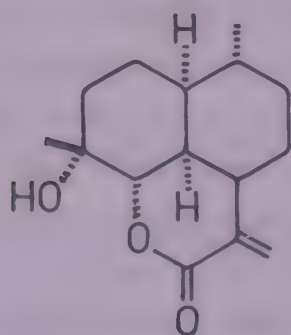
24 ξ -Ethylcholesta-7,22-dien-3 β -ol exhibited antipyretic activity (*Planta Med.* 1987, 53, 389); artemisetin showed marked antitumor activity against melanoma B16 in mice and rats but only weak activity against Pliss lymphosarcoma and hardly any against sarcoma 180 (*Rastit. Resur.* 1987, 23, 100; *Chem. Abstr.* 1987, 106, 207296 d).

A. annua L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 66).

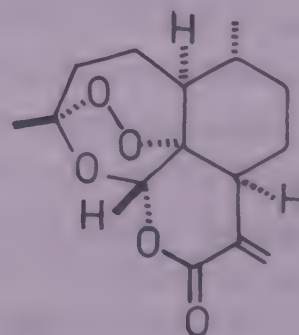
Artemisilactone isolated and its stereostructure determined and confirmed by synthesis (*Huaxue Xuebao* 1984, 42, 937; *Chem. Abstr.* 1985, 102, 21192 d); aurantiamide acetate, coumarin, 5-hydroxy-3,6,7,3',4'-pentamethoxyflavone, 5-hydroxy-3,6,7,4'-tetramethoxyflavone, β -sitosterol and stigmasterol isolated (*Zhongcaoyao* 1985, 16, 200; *Chem. Abstr.* 1987, 107, 36599 u); detection of esculetin (*Izv. Akad. Nauk Az. SSR, Ser. Biol. Nauk* 1985, 25; *Chem. Abstr.* 1985, 103, 85125 n); a new sesquiterpene lactone endoperoxide - artemisitene - isolated and its structure elucidated (*Planta Med.* 1985, 51, 441); synthesis of artemisitene (*Youji Huaxue* 1988, 8, 329; *Chem. Abstr.* 1989, 111, 78408 u); artemisic acid, octacosanol, sitosterol, stigmasterol and a flavone proposed as 3,5-dihydroxy-6,7,3',4'-tetramethoxyflavone (I) isolated (*Zhongyao Tongbao* 1985, 10, 419; *Chem. Abstr.* 1986, 104, 31768 b); structure of flavone (I) revised to 5,4'-dihydroxy-3,6,7,3'-tetramethoxyflavone (*Proc. Indian Natl. Sci. Acad.* 1985, 51A, 741); configuration of arteannuic acid at A/B ring junction determined to be cis (*Huaxue Xuebao* 1985, 43, 237; *Chem. Abstr.* 1985, 103, 160709 m); synthesis of arteannuin B (*Huaxue Xuebao* 1985, 43, 48; *Chem. Abstr.* 1985, 103, 37625 d; *Tetrahedron Lett.* 1986, 27, 3967; *J. Nat. Prod.* 1987, 50, 972); arteannuin B and artemisinin (qinghaosu, arteannuin) isolated (*Khim. Pri. Soedin.* 1986, 636; *Chem. Abstr.* 1987, 106, 64344 e; *J. Chromatogr.* 1986, 355, 448; *Phytochemistry* 1986, 25, 2892); synthesis of (+)artemisinin (*Tetrahedron Lett.* 1987, 28, 4629); process for isolation of arteannuic acid developed (*Planta Med.* 1987, 53, 501); determination

of qinghaosu content in flowers (0.72-2.32) and leaves (5.23-15.4 mg/g) by HPLC (Yaowu Fenxi Zazhi 1986, 6, 3; *Chem. Abstr.* 1986, 104, 165408 t); ^{13}C -NMR spectrum of qinghaosu determined (*Can. J. Chem.* 1985, 63, 3070; *J. Nat. Prod.* 1988, 51, 1273); qinghaosu isolated from plant of European origin (*Planta Med.* 1986, 52, 245); separation of artemisinin from artemisitene (*J. Chromatogr.* 1986, 355, 448); crystal structure of qinghaosu (*Acta Pharm. Jugosl.* 1988, 38, 71; *Chem. Abstr.* 1988, 109, 6754 q); artemisinin isolated from Turkish plant (*Acta Pharm. Turc.* 1989, 31, 41; *Chem. Abstr.* 1989, 111, 12390 a); a new sesquiterpene lactone - arteannuin C - isolated and its structure determined (*Phytochemistry* 1986, 25, 2892); synthesis of arteannuin A (*Huaxue Xuebao* 1986, 44, 968; *Chem. Abstr.* 1987, 106, 102576 s); arteannuin and deoxyarteannuin synthesised (*Tetrahedron* 1986, 42, 819); ^{13}C -NMR spectrum of arteannuin determined (*Huaxue Xuebao* 1987, 45, 305; *Chem. Abstr.* 1987, 107, 176248 d); epideoxyarteannuin B along with 6,7-dehydroartemisinic acid isolated from leaves and its structure elucidated (*Planta Med.* 1987, 53, 576; *J. Nat. Prod.* 1989, 52, 196); 11R-dihydroarteannuic acid isolated (*Huaxue Xuebao* 1987, 45, 609; *Chem. Abstr.* 1987, 107, 172466 a); α - and β -myrcene hydroperoxides isolated from aerial parts (*J. Nat. Prod.* 1987, 50, 287); artemetin, casticin and chrysosplenetin isolated from aerial parts (*Khim. Pri. Soedin.* 1988, 298; *Chem. Abstr.* 1988, 109, 70429 q); estimation of artemisia ketone (63.1), β -caryophyllene (1.92), β -pinene (1.5), 1,8-cineole (1.5%) in essential oil by GC-MS (*Zhiwu Xuebao* 1988, 30, 223; *Chem. Abstr.* 1988, 109, 134804 t); quercetagetin-3-methyl ether, 5,2',4'-trihydroxy-6,7,5'-trimethoxyflavone, 5,7,8,3'-tetrahydroxy-3,4'-dimethoxyflavone, chrysosplenol D, cirsilinol, penduletin, cirsilinol and chrysoeriol isolated from Chinese plant (*Phytochemistry* 1989, 28, 1509).

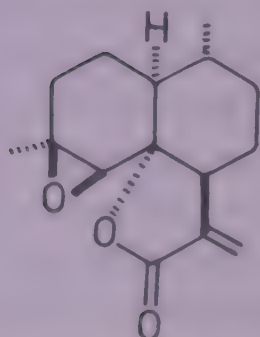
NEW COMPOUNDS



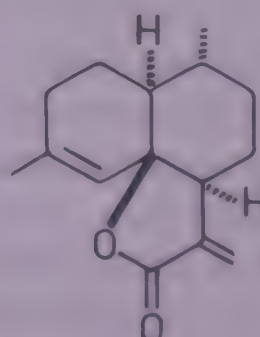
Artemisilactone



Artemisitene



Arteannuin C



Epideoxyarteannuin B

BIOLOGICAL ACTIVITY

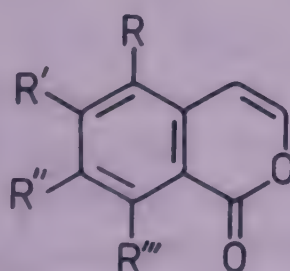
Qinghaosu caused significant changes, notably swelling of mitochondria in parasites after 2.5 hr of administration in *Plasmodium inui*-infected monkeys (*Am. J. Trop. Med. Hyg.* 1985, 34, 424; *Chem. Abstr.* 1985, 103, 134517 c); artemisinin acted rapidly as blood schizontocide against *P. berghei* and *P. yoelii nigeriensis* (*Ann. Trop. Med. Parasitol.* 1986, 80, 483; *Chem. Abstr.* 1987, 106, 211 b); artemisinin at 150.0 mg/kg, b.i.d. for 7 days, reduced level of serum IgG and hemolysin-forming capacity of mice sensitised with sheep red blood cells (SRBC). It reduced weight of thymus in SRBC-sensitised and PHA-treated mice but increased weight of spleen in these mice. On the other hand, artemisinin at same dosage enhanced PHA-induced lymphocyte transformation rate in mice and increased T cells in SRBC-sensitised mice. At a dose of 150.0 mg/kg for 5 days, artemisinin reduced percentage of phagocytosis of peritoneal macrophages. Thus, artemisinin showed both immunosuppressive and immunostimulant activities (*Zongcaoyao* 1985, 16, 66; *Chem. Abstr.* 1985, 103, 31985 z; *Asia Pac. J. Pharmacol.* 1988, 3, 197; *Chem. Abstr.* 1989, 110, 147450 v); single i.m. injection of 5.0 mg/kg artemisinin in rhesus monkeys carrying gametocytes of *Plasmodium cynomolgi* resulted in complete loss of mosquito infectivity within 24 hr of drug administration (*Chemotherapy* 1989, 35, 200; *Chem. Abstr.* 1989, 111, 108551 e).

A. capillaris Thunb.; see *A. scoparia* Waldst. & Kit.

A. caruifolia Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 68).

Three lactones (I, II and III) isolated and characterised (*Tap Chi Hoa Hoc* 1984, 22, 7; *Chem. Abstr.* 1985, 103, 19861 y).

NEW COMPOUNDS



I

$R, R''' = \text{OMe}, R', R'' = \text{H}$

II

$R, R' = \text{H}, R'', R''' = \text{OMe}$

III

$R, R' = \text{OMe}, R'', R''' = \text{H}$

A. dracunculus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 69).

5,3'-Dihydroxy-7,4'-dimethoxyflavanone, scoparone and capillarin isolated from shoots (*J. Nat. Prod.* 1985, 48, 339); estragole, limonene, myrcene, ocimene, α -phellandrene and anisaldehyde identified in oil from Turkish plant (*Doga: Tarim Ormancilik Ser.* 1986, 10, 314; *Chem. Abstr.* 1987, 106, 38207 t).

A. fragrans Willd.; see *A. maritima* L.

A. glauca Pall.

Heptadeca-1,8(cis),16-trien-11,13-diyn-15-ol isolated (*Pharmazie* 1985, 40, 365; *Chem. Abstr.* 1985, 103, 119994 n).

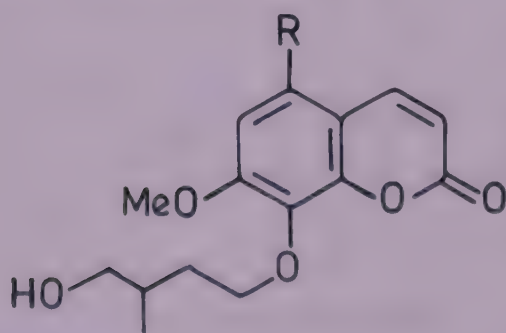
Distribution : Jammu & Kashmir, alt. 2100-2300 m.

A. laciniata Willd.

New coumarin hemiterpenes - lacarol, desoxylacarol and methyllacarol - isolated from leaves and their structures determined (*Phytochemistry* 1985, 24, 537; *Ann. Chem.* 1986, 2142); four new coumarin derivatives - neoartanin, neoartaninepoxide, neoartanindiol and isosabandin - isolated from leaves of Chinese plant; neoartanin, lacinartinepoxide and lacinartindiol isolated along with lacinartin, desoxylacarol and methyllacarol from leaves of Japanese plant; structures of new compounds determined (*Ann. Chem.* 1986, 2142); four stereoisomers - artedouglasia oxides A, B, C and D - isolated and their structures elucidated (*Ann. Chem.* 1988, 917).

Distribution : Himalayas from Kashmir to Kumaon, alt. 2400-3600 m.

NEW COMPOUNDS



Desoxylacarol

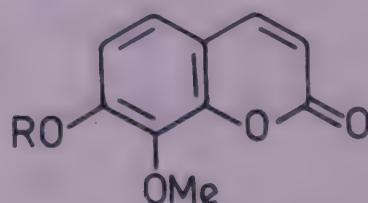
R = H

Methyllacarol

R = OMe

Lacarol

R = OH

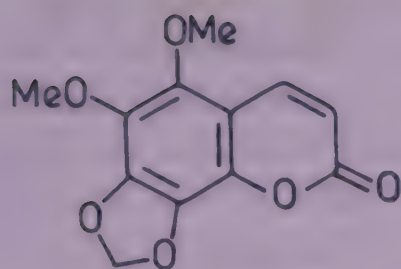


Lacinartinepoxide

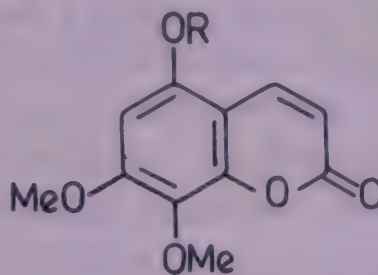
R =

Lacinartindiol

R =



Isosabandin



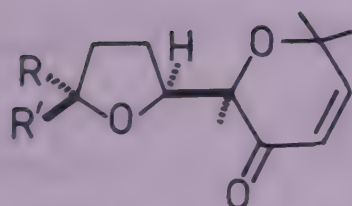
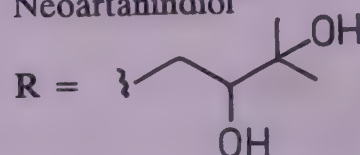
Neoartanin



Neoartaninepoxide



Neoartanindiol

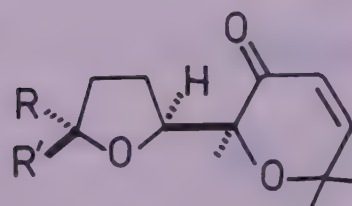


Artedouglasia oxide A

$R = \text{Me}, R' = \text{CH}=\text{CH}_2$

Artedouglasia oxide C

$R = \text{CH}=\text{CH}_2, R' = \text{Me}$



Artedouglasia oxide B

$R = \text{Me}, R' = \text{CH}=\text{CH}_2$

Artedouglasia oxide D

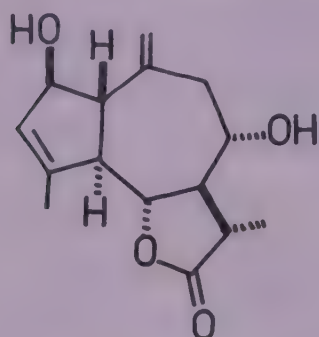
$R = \text{CH}=\text{CH}_2, R' = \text{Me}$

A. maritima L. syn. *A. fragrans* Willd., *A. spicigera* C.Koch. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 69).

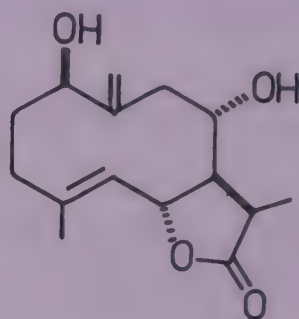
A new guaianolide - jeiranbatanolide - isolated from aerial parts and its structure established (Khim. Pri. Soedin. 1984, 595; Chem. Abstr. 1985, 102, 92940 g); isolation and structure elucidation of a new germacranolide - shonachalin A - from aerial parts (Khim. Pri. Soedin. 1985, 196; Chem. Abstr. 1985, 103, 85045 m); a new eudesmanolide - shonachalin B - isolated and characterised (Khim. Pri. Soedin. 1985, 636; Chem. Abstr. 1986, 104, 165303 e); structure of shonachalin B revised (Phytochemistry 1990, 29, 2913); a new sesquiterpene lactone - shonachalin C - isolated and its structure determined (Khim. Pri. Soedin. 1985, 787; Chem. Abstr. 1986, 105, 3493 k); revision of structure of shonachalin C (Phytochemistry 1990, 29, 2919); 1,8-cineole (36.0), α -thujone (28.0), β -thujone (12.0), camphor (7.0) and p-cymene (0.8%) estimated in oil (Khim. Pri. Soedin. 1986, 116; Chem. Abstr. 1986, 104, 212997 w); α - and β -santonins and camphor (48.0%) identified in oil (Izv. Akad. Az. SSR, Ser. Biol. Nauk

1986, 43; *Chem. Abstr.* 1987, 107, 4301 z); a new sesquiterpene - peroxysemiketal - isolated from aerial parts along with arteincultone and its structure established (*Arch. Pharm.* 1987, 320, 437; *Chem. Abstr.* 1987, 107, 20785 r); a new sesquiterpene lactone - shonachalin D - isolated from aerial parts of plant collected at Shona-chala, Azerbaijan and characterised (*Khim. Prir. Soedin.* 1987, 101; *Chem. Abstr.* 1987, 107, 93493 d); 1-oxo-6 β ,7 α ,11 β H,14 β -methylgermacra-4(5)-ene-12,6-olide (I) and 1-oxo-6 β ,7 α ,11 β H-germacra-4(5),10(14)-dien-12,6-olide (II) isolated along with vulgarin, santonin and gallicin and their structures determined (*Phytochemistry* 1987, 26, 2103).

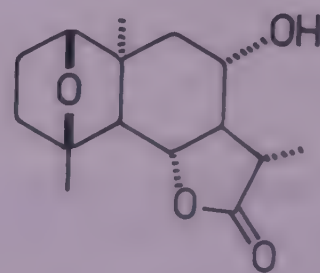
NEW COMPOUNDS



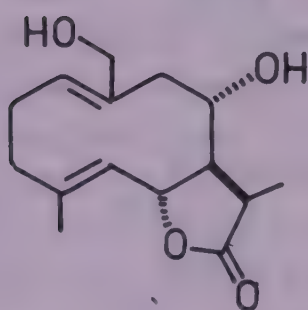
Jeiranbatanolide



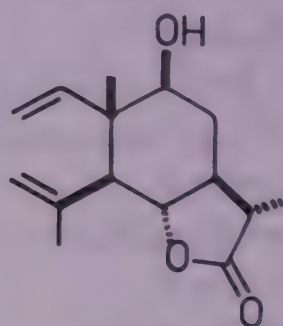
Shonachalin A



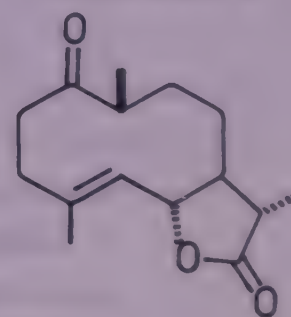
Shonachalin B



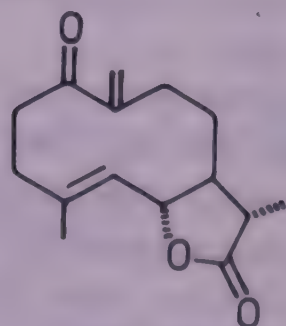
Shonachalin C



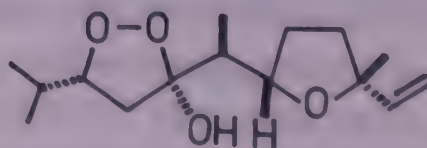
Shonachalin D



I



II



Peroxysemiketal

A. nilagirica (Clarke) Pamp. syn. *A. vulgaris* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 70).

Essential oil exhibited 90% mosquito repellency in bioassays with *Aedes aegypti* (*Proc. Pap. Annu. Conf. Calif. Mosq. Vector Control Assoc.* 52nd, 1984, 74; *Chem. Abstr.* 1985, 103, 85085 z).

Arabinose, galactose, glucose, maltose, raffinose, ribose, sucrose and crude protein obtained from stem; crude protein (15.0%) on hydrolysis yielded alanine, cystine, glycine, leucine, lysine and aspartic acid (*Acta Cienc. Indica, Chem.* 1984, 10, 272; *Chem. Abstr.* 1985, 103, 102042 c); detection of camphor, β -eudesmol, 1,8-cineole, borneol, artemisia alcohol, camphene, α -gurjunene, p-cymene, terpinen-4-ol and α -pinene in essential oil by GC-MS (*Planta Med.* 1985, 51, 457); threonine (14.82), leucine and isoleucine (12.21), glycine (12.82), glutamic acid (9.8) and arginine (8.28%) present in protein (7.2%) isolated from leaves (*Acta Cienc. Indica, Chem.* 1985, 11, 179; *Chem. Abstr.* 1987, 107, 151193 v); α -thujone (56.3%), γ -cadinene, camphor, caryophyllene, p-cymene, geraniol, linalool, β -pinene, α -terpineol and β -thujone identified in oil (*J. Nat. Prod.* 1986, 49, 940); oil from plants grown in north-eastern region of India contained camphor (40.30-56.35%) along with car-3-ene, 1,8-cineole, citral, (+)limonene, linalool, α - and β -pinenes and thujone (*Indian J. Pharm. Sci.* 1988, 50, 163).

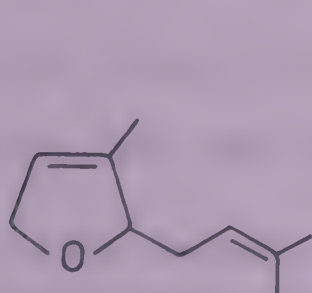
BIOLOGICAL ACTIVITY

Camphor and terpinen-4-ol exhibited 90% repellency against mosquito (*Proc. Pap. Annu. Conf. Calif. Mosq. Vector Control Assoc.* 52nd, 1984, 74; *Chem. Abstr.* 1985, 103, 85085 z).

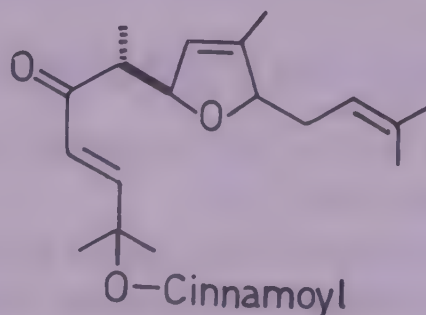
A. pallens Wall. ex DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 71).

An unusual dihydrofurano-monoterpenoid (I) and a novel nor-diterpenoid - 2-(3-methyl-but-2-enyl)-5-(5-cinnamoyloxy-2-oxo-1,5-dimethylhex-3-enyl)-3-methyl-2,5-dihydrofuran (II) - isolated from oil and characterised (*Tetrahedron Lett.* 1987, 28, 6377).

NEW COMPOUNDS



I



II

A. scoparia Waldst. & Kit. syn. *A. capillaris* Thunb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 72).

Total flavonoid and acid phenol fraction of plant extract inhibited growth of *Fusarium bulbigenum* var. *blasticola* *in vitro*; it showed marked antitumor activity also against wide range of tumors in rodents (*Rastit. Resur.* 1989, 25, 249; *Chem. Abstr.* 1989, 111, 70445 h).

Scoparone, artepillin, capillartemisin B1, artepillin C, capillarin, capillartemisin-7-methyl ether, cirsimaritin, capillarisin, capillin, scopoletin, isoscapoletin, artepillins A and C and capillene isolated (*Chem. Pharm. Bull.* 1988, 36, 769); capillene, capillin, α -curcumene,

eugenol, α - and β -pinenes and two unidentified sesquiterpenes detected in oil by GC (*Rastit. Resur.* 1989, 25, 404; *Chem. Abstr.* 1989, 111, 191525 t).

BIOLOGICAL ACTIVITY

Scoparone produced rapid and sustained fall of blood pressure in anaesthetised normotensive and experimentally hypertensive and conscious normotensive rats. The effect was dose related and appeared immediately after i.v. and within 15-20 min after p.o. administration and lasted for 2-5 hr. Hypertensive animals were more sensitive to scoparone than normotensive animals. Hypotension was accompanied by transient stimulation of respiration and increase in heart rate (*Indian J. Pharmacol.* 1985, 17, 219); it also produced a prolonged dose-related fall of blood pressure in anaesthetised normotensive dogs. It lowered arterial blood pressure (30 mm Hg) and elevated venous pressure (20 mm Hg) in hind limb of dog and increased perfusion outflow in vessels perfused with depolarising solution in rat's hind quarter (*Indian J. Med. Res.* 1988, 87, 387); a single dose of scoparone (100.0 mg/kg orally) as well as repeated oral doses for seven days, produced reduction of catecholamine content of adrenal glands and spleen without affecting that of brain, heart and small intestine. Catecholamine lowering effect appeared within 6 hr and was maximum at 24 hr. Hypotensive and tranquillo-sedative effects of scoparone appeared within 15-20 min after oral administration (*Indian J. Pharmacol.* 1987, 19, 130); scoparone, artepillin, capillartemisin B1 and artepillin C showed significant choleretic activity in wistar rats. Scoparone, artepillin, capillartemisin B1, artepillin C, scopoletin, isoscopoletin, artepillins A and C, capillene, capillarin, capillartemisin-7-methyl ether, cirsimaritin, capillarisin and capillin increased bile secretion without increasing biliary bile acid, cholesterol or phospholipid excretion (*Chem. Pharm. Bull.* 1988, 36, 769).

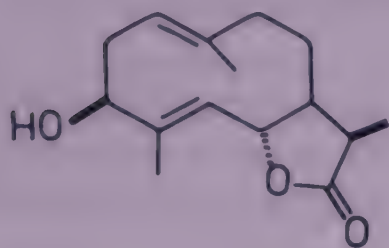
Note : The currently accepted name for this taxon is *A. capillaris* Thunb.

A. sieversiana Ehrh. ex Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 72).

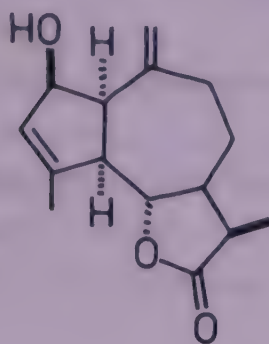
Leaves and inflorescence extract at 5.0-10.0 mg/l completely suppressed *Amaranthus* and wild oat germination (*Deposited Doc.* VINITI 1983, 3851; *Chem. Abstr.* 1985, 103, 34927 t).

New guaianolides - 11 α ,13-dihydro-4(Z)hanphyllin (I), 2 β -hydroxy-8-desoxy-11 α ,13-dihydorupicolin B (II), 11 α ,13-dihydroestafiatin, 2 α ,3 α -epoxy-11 α ,13-dihydro dehydrocostuslactone (III), 11-epiabsinthin, 10',11'-epiabsinthin, 11,10',11'-epiabsinthin, artesieversin, 8-desoxycumambrin B and 8-isovaleryloxy-nerylisovalerate (IV) - isolated from aerial parts of Mongolian plant along with sesamin, e,a-ashantin, e,e-sesartemin, e,a-, e,e- and a,a-yangambins, absinthin, ludartin and anabsinthin; structures of new compounds determined (*Phytochemistry* 1985, 24, 1009).

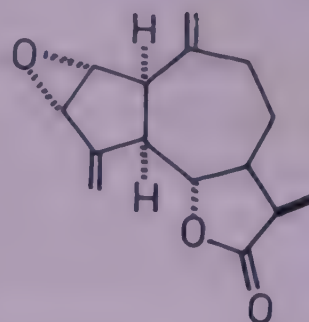
NEW COMPOUNDS



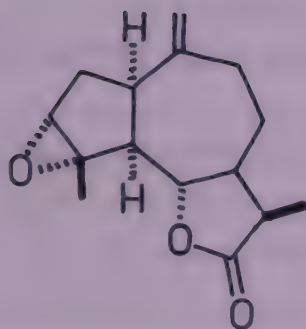
I



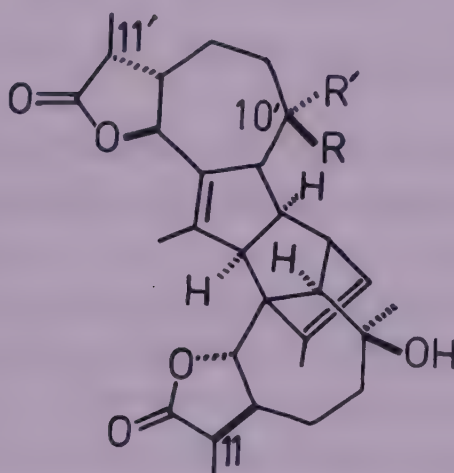
II



III



11 α ,13-Dihydroestafiatin



11-Epiabsinthin

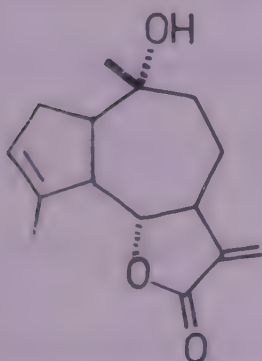
R = Me, R' = OH, 11,11' = α -H

10',11'-Epiabsinthin

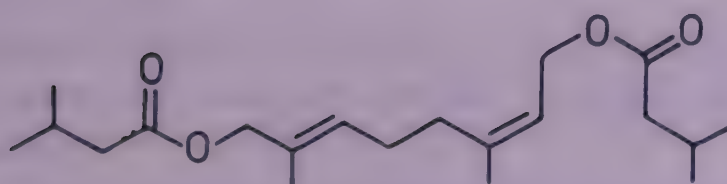
R = OH, R' = Me, 11,11' = β -H

11,10',11'-Epiabsinthin

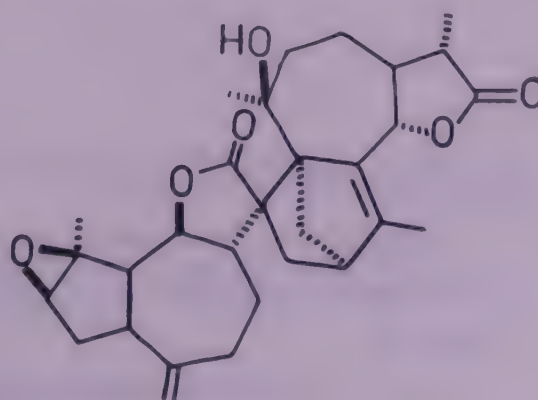
R = OH, R' = Me, 11 = α -H, 11' = β -H



8-Desoxycumambrin B



8-Isovaleryloxy-nerylisovalerate



Artesieversin

A. spicigera C. Koch.; see *A. maritima* L.

A. vestita Wall. ex DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 77).

Detection of α -, β - and γ -himachalenes, caryophyllene, germacrene D, himachalol, allohimachalol, α - and γ -atlantones, 1,8-cineole, yomogi alcohol, artemisia and santolina alcohols and their acetates, thujones and thujanols in essential oil by GLC-MS (*Planta Med.* 1987, 53, 66).

A. vulgaris L.; see *A. nilagirica* (Clarke) Pamp.

ARTOCARPUS (Moraceae)

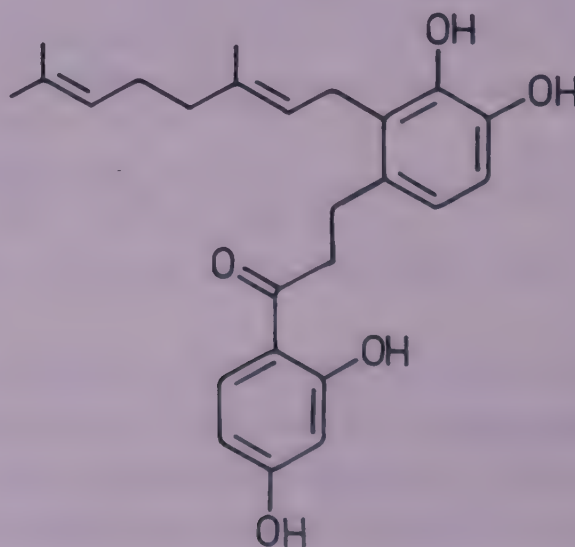
A. communis J.R. & G. Forst. syn. *A. incisus* (Thunb.) L.f. (*incisa*)

Eng. - Bread fruit; B. - Dephal; Mal. - Kadachakka; Mar. - Vilayti phanas; Tam. - Seema panasa.

2-Geranyl-3,4,2',4'-tetrahydroxychalcone isolated from flowers (Jpn. 6,323,816 (1988) Feb. 01; *Chem. Abstr.* 1988, 109, 134965 w); a new 5-lipoxygenase inhibitor - AC-5-I - isolated and its structure determined and confirmed by synthesis (*Heterocycles* 1989, 29, 427).

Distribution: Native of Pacific Islands, grown in Maharashtra and south India.

NEW COMPOUNDS



AC-5-I

BIOLOGICAL ACTIVITY

2-Geranyl-3,4,2',4'-tetrahydroxychalcone inhibited 5-lipoxygenase totally but stimulated prostaglandin synthetase by 10.0% (Jpn. 6,323,816 (1988) Feb. 01; *Chem. Abstr.* 1988, 109, 134965 w).

AC-5-I markedly inhibited 5-lipoxygenase (half-inhibition concentration, 50.0 nM);

however, prostaglandin-synthesising activity was inhibited only at 10.0 μ M. Leukotriene C₄ synthesis by mouse peritoneal cells facilitated by Ca-ionophore, was inhibited by 96.0% at 10.0 μ M. Arachidonic acid-induced ear oedema of mice (*in vivo* model involving leukotriene induction) was markedly inhibited in dose-dependent manner. Inhibition was the strongest of any inhibitors of 5-lipoxygenase reported previously (Ensho 1988, 8, 543; *Chem. Abstr.* 1989, 111, 375 m).

A. incisus (Thunb.) L.f.; see *A. communis* J.R. & G. Forst.

ASARUM (Aristolochiaceae)

A. europaeum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 73).

α -Asarone isolated from roots (*Farmakol. Toksikol.* 1985, 48, 17; *Chem. Abstr.* 1986, 104, 28405 a); β -sitosterol, trans-phytol (35.1%), β -carotene and α -tocopherol identified in leaves; β -sitosterol also present in rhizomes (*Pharmazie* 1987, 42, 141; *Chem. Abstr.* 1987, 107, 74266 r); isoquercitrin, trifolin, kaempferol-3-rutinoside and quercetin isolated from whole plant (*Herba Pol.* 1987, 33, 167; *Chem. Abstr.* 1988, 109, 187324 t).

BIOLOGICAL ACTIVITY

α -Asarone showed tranquillizing, sedative, antiulcer, spasmolytic and antisclerosis activities in various animals. Its LD₅₀ was 417.6 mg/kg (oral) and 310.0 mg/kg (i.p.) in mice (*Farmakol. Toksikol.* 1985, 48, 17; *Chem. Abstr.* 1986, 104, 28405 a).

ASCLEPIAS (Asclepiadaceae)

A. curassavica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 74).

Hesperidin isolated from stem (*J. Inst. Chem. (India)* 1989, 61, 53; *Chem. Abstr.* 1989, 111, 229043 z).

BIOLOGICAL ACTIVITY

Asclepin is a potent cardenolide with a wide margin in comparison with other commonly used cardiac glycosides (*Indian Drugs* 1985, 22, 285).

ASPARAGUS (Liliaceae)

A. curillus Buch.-Ham. ex Roxb. syn. *A. nepalensis* Baker (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 76).

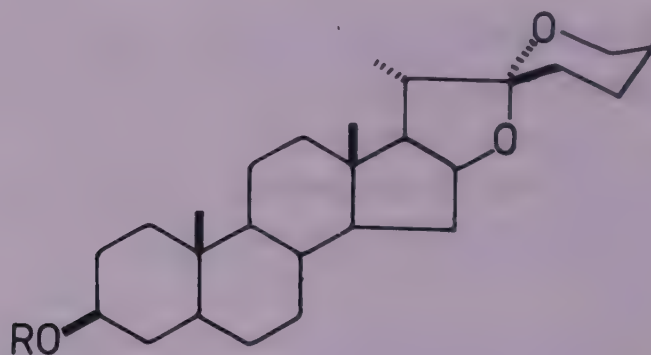
Saponin mixture showed significant activity against P-388 leukaemia and JTC-26 carcinoma (*Pharmazie* 1985, 40, 586; *Chem. Abstr.* 1986, 104, 28519 r).

A. nepalensis Baker; see *A. curillus* Buch.-Ham. ex Roxb.

A. officinalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 77).

Hyperoside, isoquercitrin, kaempferol-3-O-L-rhamnoglucoside and cosmosiin isolated from flowering plant; rutin, quercetin oligoglucoside and two kaempferol glucosides also obtained from herb (*Planta Med.* 1985, 51, 288); alkanes (31.5), wax esters (20.1), alcohols (16.4), aldehydes (13.5), fatty acids (8.3) and ketones (6.4%) estimated by GC in epicuticular wax of cladophyllus (*Agric. Food Chem.* 1986, 34, 1024; *Chem. Abstr.* 1987, 106, 81586 c); a new spirostanol glycoside - 3-O- $\{[\alpha\text{-L-rhamnopyranosyl}(1\rightarrow4)]\text{-}[\beta\text{-D-glucopyranosyl}(1\rightarrow2)]\text{-}\beta\text{-D-glucopyranosyl}\}$ (25S)5 β -spirostan-3 β -ol (I) - isolated from fruits and characterised (*Phytochemistry* 1988, 27, 3324).

NEW COMPOUNDS



I

R = Glu[(2 \rightarrow 1)Glu](4 \rightarrow 1)Rha

BIOLOGICAL ACTIVITY

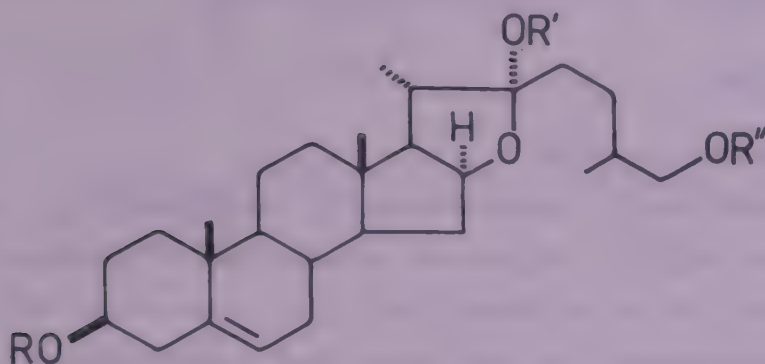
Spirostanol glycosides asparagosides C and D, showed 20.0-44.0% inhibition in growth of mammary gland adenocarcinoma 755 and cancers of pancreas and cervix uteri in inoculated mice (*Nauka-Farm. Prakt.* 1984, 38; *Chem. Abstr.* 1986, 104, 373 q).

A. plumosus Baker

Two new furostanol glycosides - 3-O- $[\alpha\text{-L-rhamnopyranosyl}(1\rightarrow2)\text{-}\alpha\text{-L-rhamnopyranosyl}(1\rightarrow3)\text{-}\beta\text{-D-glucopyranosyl}]$ -26-O- $\beta\text{-D-glucopyranosyl}$ -(25S)22 α -methoxyfurost-5-en-3 β , 26-diol (I) and its 22-hydroxy derivative (II) - isolated from leaves and characterised (*J. Nat. Prod.* 1985, 48, 390).

Distribution : Introduced into Indian gardens.

NEW COMPOUNDS



I

R = Glu[(2→1)Rha](3→1)Rha, R' = Me, R'' = Glu

II

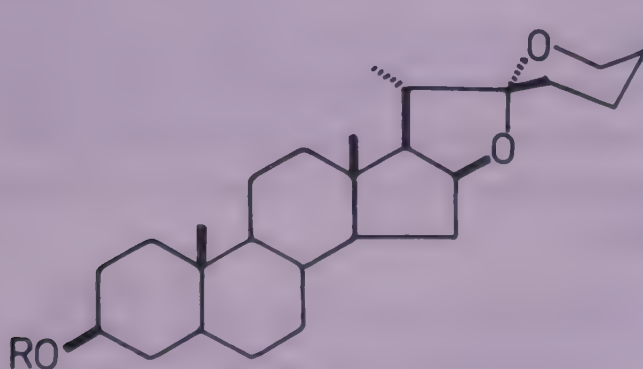
R = Glu[(2→1)Rha](3→1)Rha, R' = H, R'' = Glu

A. racemosus Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 78).

Clinical efficacy of root powder (12.0 g/day for six weeks) evaluated in patients with duodenal ulcer. In 75 % cases, it relieved most of the symptoms (reduction in gastric acid response, endoscopic improvement). It did not exhibit antacid activity; inhibited basal output by 48.0, histamine-induced maximum output by 38.0 and alcohol-induced secretion by 32.0% (*J. Res. Ayurveda & Siddha* 1986, 7, 91).

Four glycosides - compound A, shatavarin I, shatavarin II and shatavarin IV - isolated from roots; structure of shatavarin IV elucidated (*Indian J. Chem.* 1987, 26B, 1012).

NEW COMPOUNDS



Shatavarin IV

R = Glu[(2→1) Rha](4→1)Glu

BIOLOGICAL ACTIVITY

Shatavarin-I showed specific antioxytotic activity *in vitro* and *in vivo* (*Indian J. Chem.* 1987, 26B, 1012).

ASPIDIXIA (Loranthaceae)

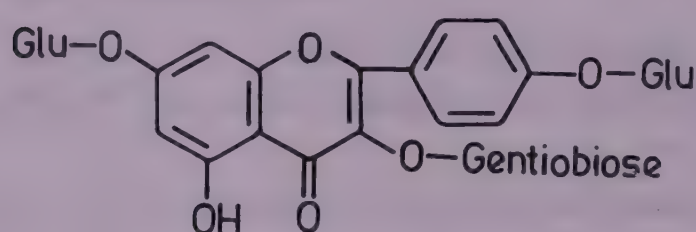
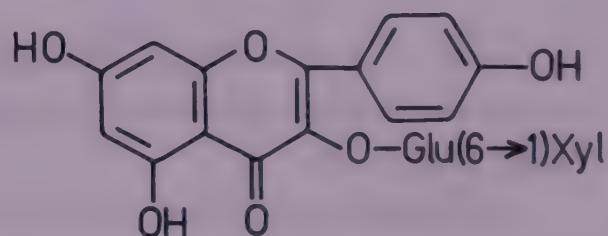
A. articulata (Burm.f.) Van Tiegh; see *Viscum articulatum* Burm.f.

ASPLENIUM (Aspleniaceae)

A. nidus L. syn. *Thamnopteris nidus* Presl

A new flavonoid - kaempferol-3-O-gentiobioside-7,4'-bisglucoside (I) - isolated from aerial parts along with kaempferol-3-O-diglucoside and kaempferol-3,7-diglucoside and its structure determined (*Liaison-Groupe Polyphenols* 1986, 13, 63; *Chem. Abstr.* 1988, 108, 34770 q; *Chem. Ind.* 1986, 555); a new flavonol glycoside isolated and characterised as kaempferol-3-O-vicianoside (*Chem. Ind.* 1987, 487).

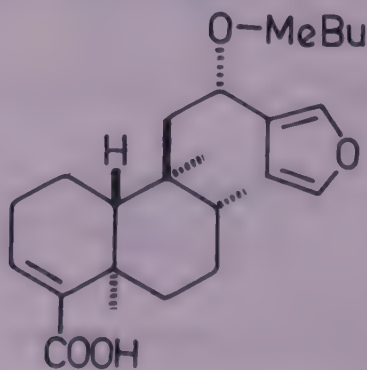
Distribution : Hilly regions of India.

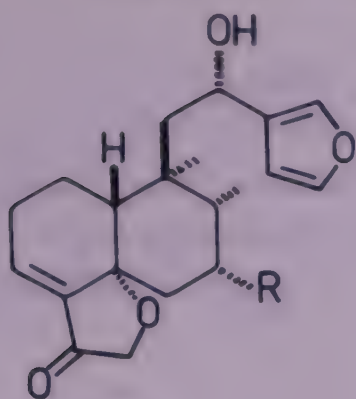
NEW COMPOUNDS**I****Kaempferol-3-O-vicianoside****ASTER** (Asteraceae)

A. altaicus Willd. syn. *Heteropappus altaicus* (Willd.) Novopkr.

Five new diterpenes - 12 α -[2-methylbutyryloxy]hardwickiic acid (I), 12 α -hydroxyhautriwaic acid-19-lactone (II), 7 α ,12 α -dihydroxyhautriwaic acid-19-lactone (III), 12 α -[2-methylbutyryloxy]strictic acid (IV) and 1-hydroxy-3,7,15-trimethylhexadeca-2E, 6E,10E,14-tetraen-11-oic acid (V) - isolated from aerial parts along with germacrene D, caryophyllene-1 β ,10 α -epoxide, farnesol, 5-O-desmethylnobiletin, (-)-hardwickiic acid and hautriwaic acid; structures of new compounds determined (*Phytochemistry* 1985, 24, 1027).

Distribution : Himalayas, from Kashmir to Kumaon, alt. 2700-4200 m.

NEW COMPOUNDS**I**

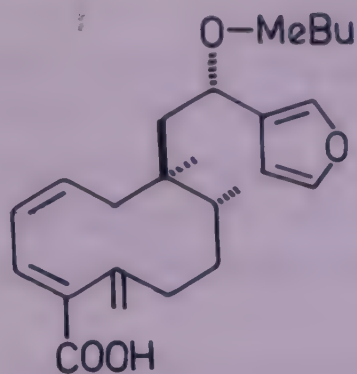


II

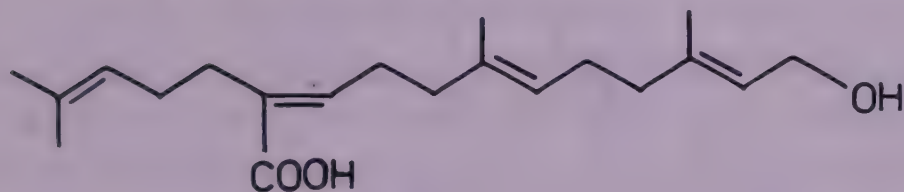
R = H

III

R = OH



IV



V

A. himalaicus Clarke

p-Hydroxyacetophenone, taraxerol, friedelin and epifriedelinol isolated from whole plant (*Indian J. Chem.* 1989, 28B, 256).

Distribution: Nepal and Sikkim, alt. 3900-4500 m.

ASTILBE (Saxifragaceae)

A. rivularis Buch.-Ham. ex D.Don (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 83).

β -Amyrin, β -peltoboykinolic acid, astilbic acid, quercetin, bergenin and β -sitosterol isolated from aerial parts (*Indian Drugs* 1987, 24, 354).

ASTRAGALUS (Papilionaceae)*A. coluteocarpus* Boiss.

Kaempferol, astragalin, quercetin, rutin, hyperoside and luteolin isolated from aerial parts (*Khim. Prir. Soedin.* 1987, 454; *Chem. Abstr.* 1987, 107, 151270 s).

Distribution : Kashmir, alt. 1800-3000 m.

A. macropterus DC. (*macropterum*)

Apigenin and its 7-O-glucoside, kaempferol, quercetin, rutin and hyperoside isolated from aerial parts (*Khim. Prir. Soedin.* 1986, 513; *Chem. Abstr.* 1987, 106, 2903 c).

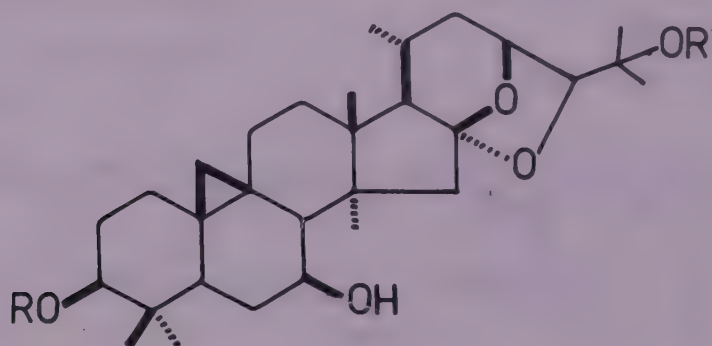
Distribution: Ladakh, alt. 3000-4000 m.

A. orbiculatus Ledeb.

A new cycloartane derivative - cycloorbigenin - isolated from aerial parts and characterised (*Khim. Prir. Soedin.* 1986, 455; *Chem. Abstr.* 1987, 106, 47193 n); isolation of cycloorbicoside A from aerial parts and its structure determination (*Khim. Prir. Soedin.* 1986, 719; *Chem. Abstr.* 1987, 106, 192744 x); another cycloartane glycoside - cycloorbicoside G - isolated from aerial parts and its structure elucidated (*Khim. Prir. Soedin.* 1987, 837; *Chem. Abstr.* 1988, 108, 201714 j).

Distribution : Kashmir, alt. 2400-3000 m.

NEW COMPOUNDS



Cycloorbigenin

R, R' = H

Cycloorbicoside A

R = Xyl, R' = H

Cycloorbicoside G

R = Xyl, R' = Glu

A. peduncularis Royle

Rutin, caffeic acid and isoquercitrin isolated from aerial parts of flowering plant (*Khim. Prir. Soedin.* 1988, 876; *Chem. Abstr.* 1989, 111, 54156 j).

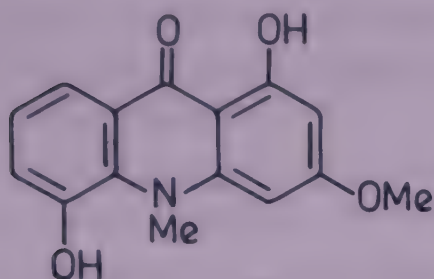
Distribution: Kashmir and Ladakh, alt. 2700-3600 m.

ATALANTIA (Rutaceae)

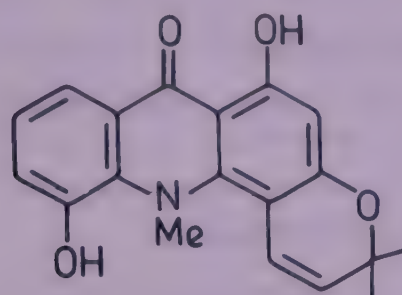
A. ceylanica (Arn.) Oliv. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 81).

Isolation of 1,5-dihydroxy-3-methoxy-10-methyl-9(10H)-acridinone (I) and 11-hydroxy-noracronycine along with 2,4,5-trimethoxybenzaldehyde and carpachromene from leaves; structure determination of new compounds (*Planta Med.* 1987, 53, 73).

NEW COMPOUNDS



I



11-Hydroxynoracronycine

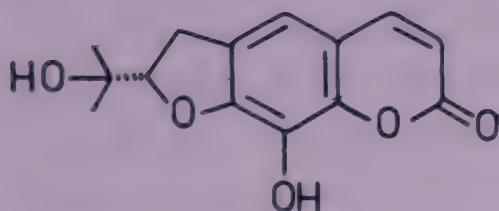
A. racemosa Wt. & Arn.

Tam. - Kattunaranga.

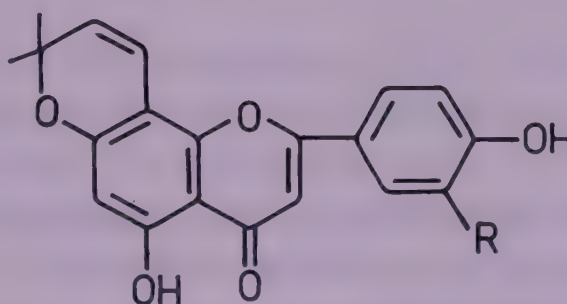
A new coumarin - racemol - isolated from fruits and its structure determined and confirmed by X-ray studies; xanthyletin and xanthotoxin also isolated (*Indian Drugs* 1986, 23, 487); two new pyranoflavones - atalantoflavone and racemoflavone - isolated from aerial parts together with xanthyletin, luvangetin, racemosin, xanthotoxin, umbelliferone, rutarin, rutaretin and friedelin; structures of new compounds determined (*Phytochemistry* 1988, 27, 3637).

Distribution : Western part of Deccan Peninsula from Konkan to Travancore.

NEW COMPOUNDS



Racemol



Atalantoflavone

R = H

Racemoflavone

R = OMe

A. wightii Tanaka (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 82).

Ethyl p-coumarate and tetratriacontanoic acid isolated (*Indian J. Chem.* 1988, 27B, 594).

ATROPA (Solanaceae)

A. belladonna L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 82).

BIOLOGICAL ACTIVITY

Atropine and scopolamine at minimal i.p. doses markedly increased foot-pad skin temperature of rats due to vasodilatory action. Atropine was more potent vasodilator in denervated than in intact limb (*Zhongguo Yaoli Xuebao* 1985, 6, 26; *Chem. Abstr.* 1985, 102, 160243 j).

ATYLOSIA (Papilionaceae)

A. scarabaeoides (L.) Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 31).

Hentriacontane, β -sitosterol glucoside, D(+)pinitol, vitexin and hexacosanyl esters of palmitic, stearic, arachidic and oleic acids identified in leaves (*Fitoterapia* 1985, 56, 122).

AVICENNIA (Avicenniaceae)

A. marina (Forsk.) Vierh. syn. *A. officinalis* sensu Clarke, p.p. (non L.) (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 87).

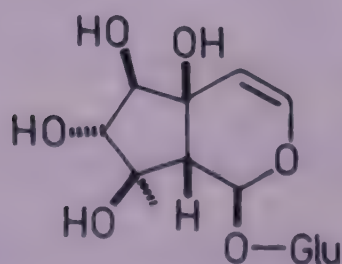
2'-Cinnamoylmussaenoside, 10-O-(5-phenyl-2,4-pentadienoyl)geniposide and 7-O-(5-phenyl-2,4-pentadienoyl)-8-epiloganin isolated along with mussaenoside and geniposide (*Phytochemistry* 1985, 24, 1245).

A. officinalis Clarke; see *A. marina* (Forsk.) Vierh., *A. officinalis* L.

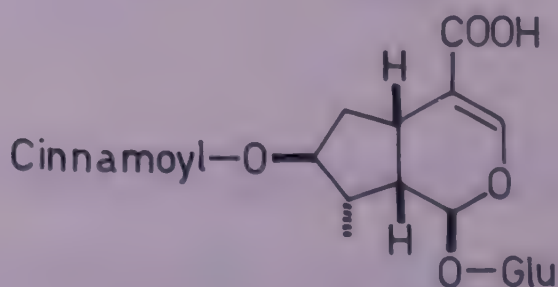
A. officinalis L. syn. *A. tomentosa* auct. (non Jacq.), *A. officinalis* sensu Clarke, p.p. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 85).

Two new iridoids - avicennioside and 7-cinnamoyl-8-epiloganic acid - isolated from leaves along with geniposidic acid and 2'-cinnamoylmussaenosidic acid and structures of new compounds determined (*Phytochemistry* 1987, 26, 423).

NEW COMPOUNDS



Avicennioside



7-Cinnamoyl-8-epiloganic acid

A. tomentosa Jacq.; see *A. officinalis* L.

AZADIRACHTA (Meliaceae)

A. indica (L.) A. Juss. syn. *Melia azadirachta* L., *M. indica* Brandis (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 85).

Oral administration of 2.0 ml of neem oil from day 1 to 10 of pregnancy to female rats, showed on 16th day growth of foetuses retarded in 50.0% animals. In another group of animals given the same treatment orally but allowed to complete the term, 80.0% animals did not deliver, indicating foetal resorption and 80.0% antifertility activity (*Indian J. Med. Res.* 1983, 83, 89); intravaginal administration studies of neem oil in rat suggested that antifertility effect was due to absorption of its active constituent(s) through vaginal mucosa, into the circulation (*Indian J. Med. Res.* 1988, 88, 339); extract of leaves did not show oestrogenic activity in rats, as evidenced by insignificant change in weight of uterus and adrenals, absence of open vagina and epithelial cells in vaginal smear and incomplete development of uterus (*Indian J. Physiol. Pharmacol.* 1986, 30, 118); odorous viscous steam distillate from fresh leaves exhibited *in vitro* antifungal activity (MIC 125 µg/ml) against *Trichophyton mentagrophytes* (*Fitoterapia* 1986, 57, 302); an acidic fraction from leaves showed insect growth-regulating activity in mosquitoes (*Heterocycles* 1986, 24, 1319); seed oil produced increase in cutaneous capillary permeability in Evans blue-treated rabbits 1 hr after application which persisted for 4 hr (*Indian J. Pharmacol.* 1988, 20, 203). The oral LD₅₀ of neem oil was 14.0 ml/kg in rats and 24.0 ml/kg in rabbits (*J. Ethnopharmacol.* 1988, 23, 39); plant extract showed insect growth-regulating activity against pulse beetle, *Callasobruchus analis* (*J. Chem. Soc. Perkin 1* 1987, 1429); purified bark extract showed significant anti-bacterial activity (*Phytochemistry* 1988, 27, 3903); aqueous extract of leaves lowered hyperglycaemia in streptozotocin-diabetes (*Phytother. Res.* 1989, 3, 30; *Chem. Abstr.* 1989, 111, 529 q).

New meliacin - solannolide - isolated and its structure elucidated (*Phytochemistry* 1984, 23, 2383); isolation of nimocinol from leaves and its characterisation as 6 α -hydroxyazadirone (*Phytochemistry* 1984, 23, 2899); negative ion MS of epoxyazadiradione, gedunin, nimbolide, deacetylnimbin and nimbin (*Indian J. Chem.* 1984, 23B, 1082); a new limonoid - deacetylazadirachtinol - isolated and its structure established (*Tetrahedron Lett.* 1984, 25, 4729; *Tetrahedron* 1986, 42, 489); structure of azadirachtin revised (*F.E.C.S. Int. Conf. Chem. Biotechnol. Biol. Act. Nat. Prod.* 3rd, 1985, 446; *Chem. Abstr.* 1989, 111, 74740 y; *Chem. Commun.* 1985, 968); NMR studies of azadirachtin (*Tetrahedron Lett.* 1985, 26, 6435; *Chem. Commun.* 1986, 46; *Tetrahedron* 1987, 43, 2789); a new meliacin - 4-epinimbin - isolated from seeds and its structure determined (*Indian J. Chem.* 1985, 24B, 1105); isolation and structure elucidation of azadirachtol from fruits (*Planta Med.* 1985, 51, 478); 2',3'-dehydrosalannol isolated from leaves and characterised (*Phytochemistry* 1985, 24, 866); a new limonoid - azadirachtanin - isolated from leaves and characterised (*Heterocycles* 1985, 23, 2321).

Azadirachtin, salannin, 6-O-acetylnimbandiol and 3-desacetylsalannin isolated from fruit

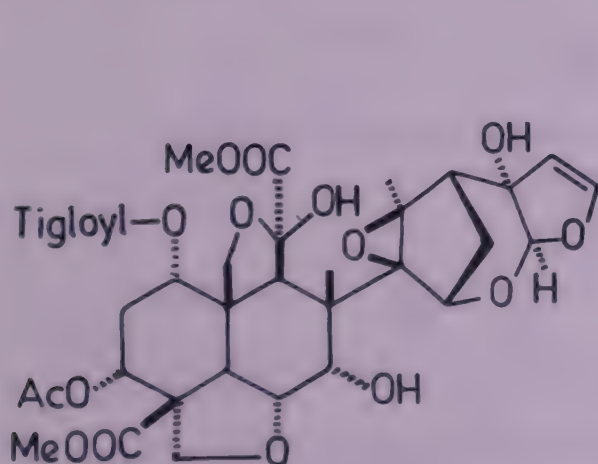
essential oil (*Tetrahedron* 1986, 42, 489); a new γ -hydroxybutenolide tetranortriterpenoid - isonimbocinolide - isolated from acidic fraction of fresh leaves and its structure determined (*Heterocycles* 1986, 24, 1319); isolation and structure elucidation of margosinolide and isomargosinolide (*Tetrahedron* 1986, 42, 4849); isolation of new meliacins - nimocinolide, isonimocinolide - from fresh leaves and nimocin from fruits and their structures elucidation; azadirone, gedunin, azadiradione, epoxyazadiradione, 7-deacetyl-7-benzoylazadiradione, 17-hydroxyazadiradione, β -sitosterol and cholesterol also isolated (*J. Chem. Soc. Perkin 1* 1986, 1021; *Z. Naturforsch.* 1986, 41B, 922; *Chem. Abstr.* 1986, 105, 112034 g); a new limonoid - nimbocinol - isolated from ripe fruits and its structure established (*Z. Naturforsch.* 1986, 41B, 922; *Chem. Abstr.* 1986, 105, 112034 g); isolation and structure determination of desacetylnimbinolide and desacetylisnimbinolide along with isolation of desacetylnimbin (*J. Nat. Prod.* 1986, 49, 1068); a new tetranortriterpenoid - isoazadirolide - isolated from fresh leaves together with scopoletin and characterised (*Heterocycles* 1986, 24, 3163); a new triterpenoid - nimolinone - isolated from fresh, uncrushed, ripe fruits and its structure elaborated (*J. Chem. Soc. Pak.* 1986, 8, 341; *Chem. Abstr.* 1987, 106, 64306 u); isolation and structure determination of nimbocinone from fresh winter leaves; sitosterol and stigmasterol also obtained (*Phytochemistry* 1986, 25, 2183); tetranortriterpenoids - isonimolide and isolimbolide - isolated from twigs and their structures elucidated (*Heterocycles* 1987, 26, 1827); two new triterpenoids - isonimolicinolide and nimolicinoic acid - isolated from fruits and characterised (*J. Chem. Soc. Perkin 1* 1987, 1429); isolation and structure determination of salannolactam-(21) and salannolactam-(23) from seed kernels (*Ann. Chem.* 1987, 337); 7-deacetyl-17 β -hydroxyazadiradione isolated from seeds along with azadiradione and its structure determined (*Phytochemistry* 1988, 27, 2773); 24-methylenecycloartanol, nimbin, azadirone, gedunin, protein-bound amino acids, glucose, fructose, mannose, xylose and β -sitosterol isolated from stem exudate (*Curr. Sci.* 1988, 57, 550); a new seco-tetranortriterpenoid - isonimbinolide - isolated from bark and characterised (*Phytochemistry* 1988, 27, 1801); new tetranortriterpenoid - nimbocinolide - isolated from leaves and characterised (*Heterocycles* 1989, 29, 87); two new tetranortriterpenoids - nimbanal and salannol-3-acetate - isolated from seeds and their structures established (*Phytochemistry* 1989, 28, 203); isolation and structure determination of nimbolicin from root bark; isolation and ¹³C-NMR of nimbolin B (*Heterocycles* 1989, 29, 729); 1,3-diacetyl-11,19-deoxa-11-oxomeliacarpin (I) isolated from seeds and its structure established (*Tetrahedron Lett.* 1989, 30, 1797).

Nimbidiol isolated from root bark and its structure determined (*Phytochemistry* 1987, 26, 3021). Synthesis of nimbidiol (*Indian J. Chem.* 1988, 27B, 103); new diterpenoids - nimbionone and nimbionol - isolated from bark and their structures elucidated (*Phytochemistry* 1988, 27, 3903); two new isomeric diterpenoids - nimbione and nimbinone - isolated from bark and characterised (*Phytochemistry* 1988, 27, 1801); new diterpenoids - nimosone, nimbosone and methyl nimbionone - isolated from stem bark along with methylnimbiol and sugiol; structures

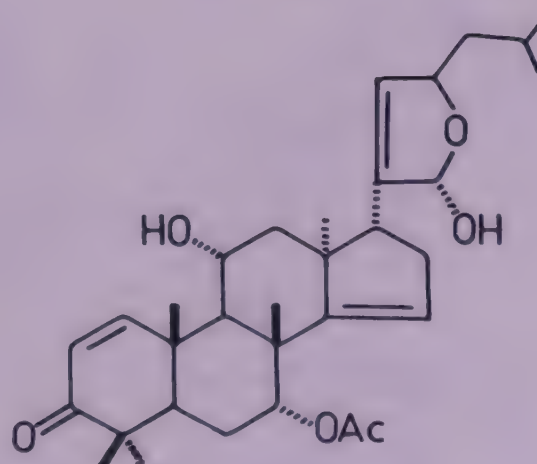
of new compounds determined (*J. Nat. Prod.* 1988, 51, 1054); isolation and structure determination of new diterpenoids - margolone, margolonone and isomargolonone - from stem bark (*J. Chem. Soc. Perkin 1* 1989, 343); two new isomeric diterpenoids - nimbonone and nimbonolone - isolated from stem bark together with methyl grevillate and characterised (*Phytochemistry* 1989, 28, 1177).

An isoprenylated flavanone - nimbaflavone - isolated from leaves and characterised (*Phytochemistry* 1984, 23, 2115); two new water-soluble polysaccharides - GIII DO'₂ Ia and GIII DO'₂ IIa - isolated from bark; GIII DO'₂ Ia partially characterised as branched fucogalactoglucoarabinan (*Shoya-kugaku Zasshi* 1984, 38, 334; *Chem. Abstr.* 1985, 103, 153581 k); antitumor polysaccharide N9GI, isolated from bark, shown to be a mixture of N9GIa and N9GIb; former contained glucan and arabinose (5:1) while the latter contained glucan, fucose and arabinose (5:2:1) (*Jpn.* 6,042,329 (1985) Mar. 06; *Chem. Abstr.* 1985, 103, 200865 t); nimbochalcin and nimboctin isolated from fruits along with 5-hydroxymethylfurfural and their structures determined; quercetin, its glycoside and isorhamnetin isolated from leaves (*Pakistan J. Sci. Ind. Res.* 1985, 28, 1; *Chem. Abstr.* 1985, 103, 51179 t); 24-methylenelophenol isolated from heartwood (*Phytochemistry* 1987, 26, 2644); viscous steam distillate of fresh leaves found to contain mixture of cyclic tri- and tetrasulphides of C3, C5, C6 and C9 units by GC-MS (*Fitoterapia* 1986, 57, 302); a water-soluble polysaccharide, CSP-I, isolated from bark, composed of galactose, arabinose and glucose in ratio of 4:2:1 and having (1→3)linked galactopyranosyl backbone (*Chem. Pharm. Bull.* 1988, 36, 2654); detection of di-n-propyl and n-propyl-1-propenyl di-, tri- and tetrasulphides in seeds by GC-MS; di-n-propyl disulphide present as major constituent (75.74%) (*J. Agric. Food Chem.* 1988, 36, 1048; *Chem. Abstr.* 1988, 109, 125861 g); quercetin-3-O-β-D-glucoside, -3-O-rutinoside and -3-O-α-L-rhamnoside, kaempferol-3-O-rutinoside and -3-O-β-D-glucoside and myricetin-3-O-rutinoside from leaves (*Phytother. Res.* 1989, 3, 30; *Chem. Abstr.* 1989, 111, 529 q).

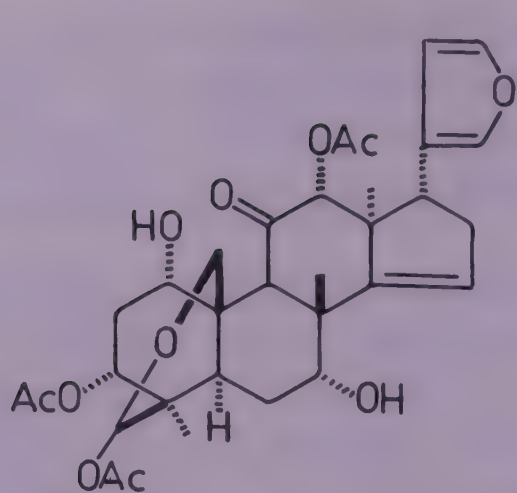
NEW COMPOUNDS



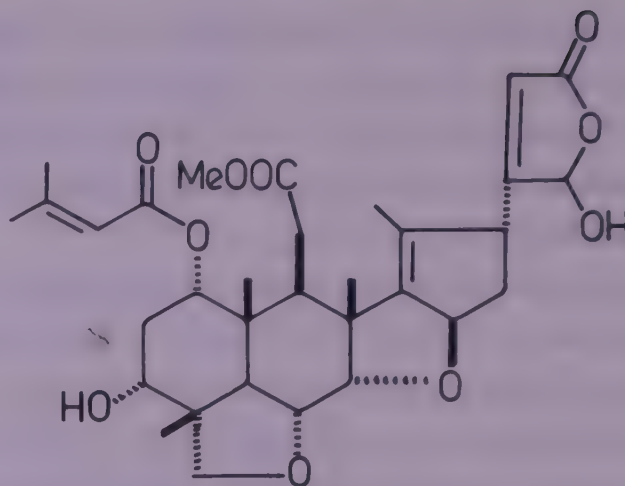
Azadirachtin



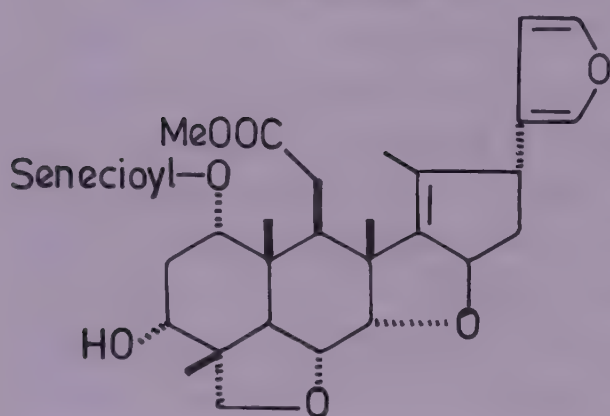
Azadirachtol



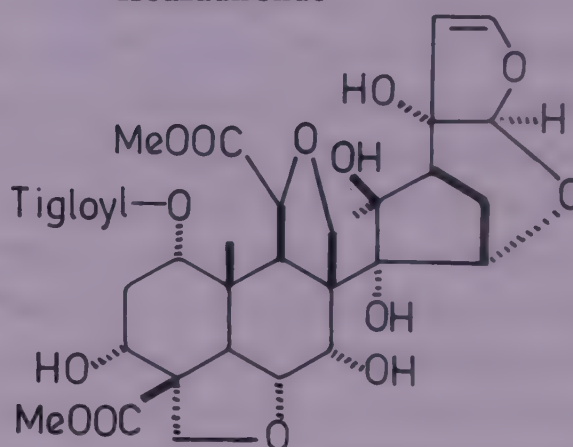
Azadirachtanin



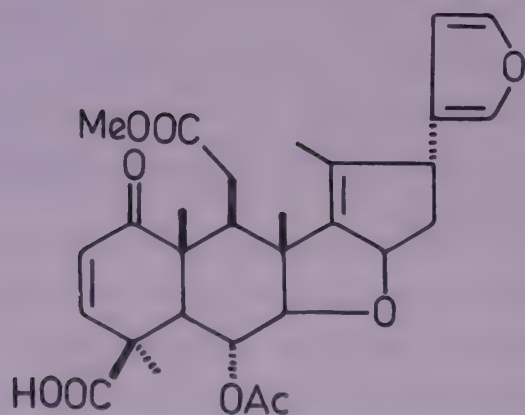
Isoazadirolide



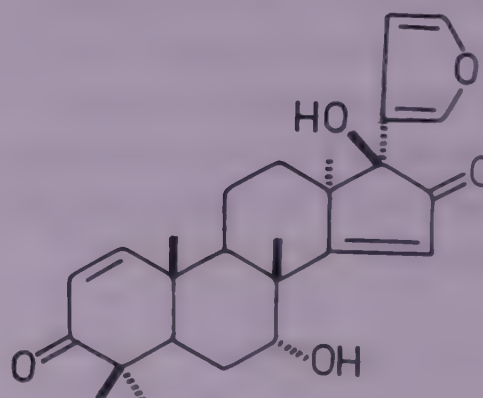
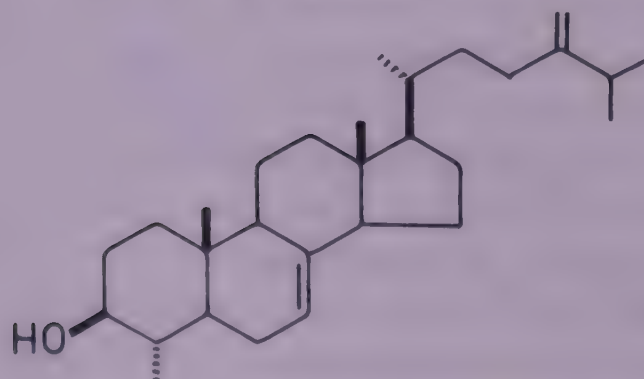
2',3'-Dehydrosalannol



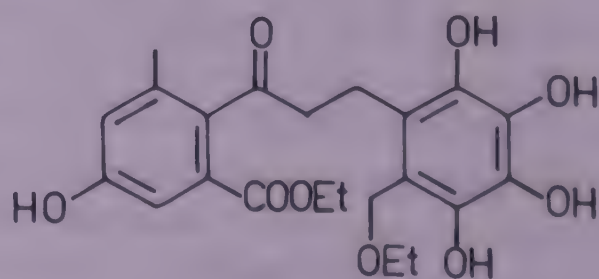
Deacetylazadirachtinol



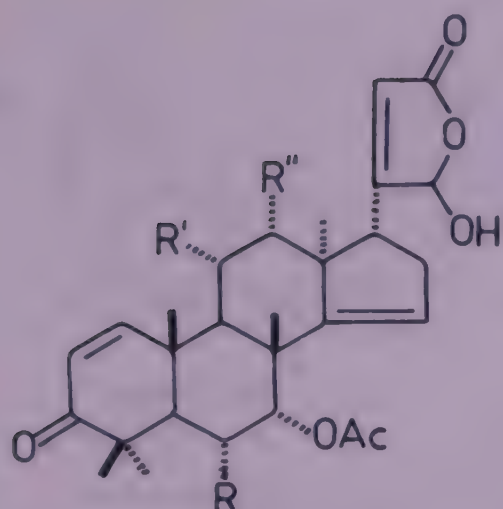
4-Epinimbin

7-Deacetyl-17 β -hydroxyazadiradione

24-Methylenelophenol



Nimbochalcin

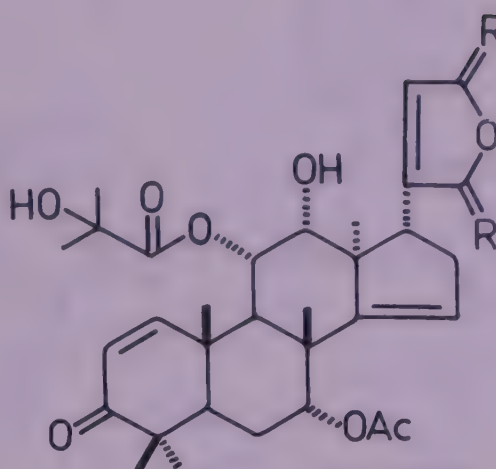


Isonimolide

R = OMe, R', R'' = H

Isolimbolide

R = H, R' = OAc, R'' = OH

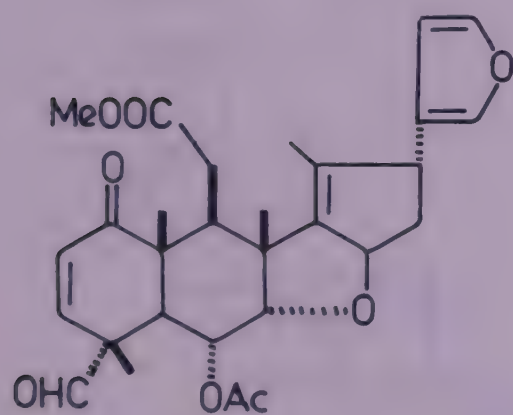


Nimbocinolide

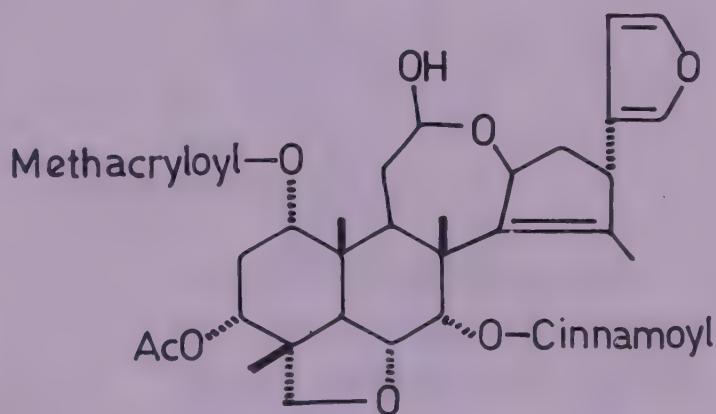
R = H, OH, R' = O

Isonimbocinolide

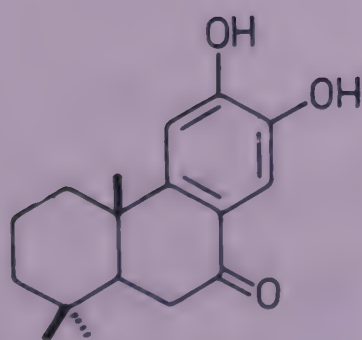
R = O, R' = H, OH



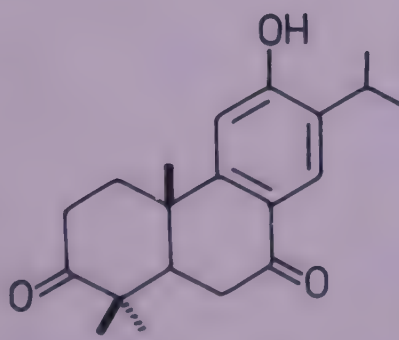
Nimbanal



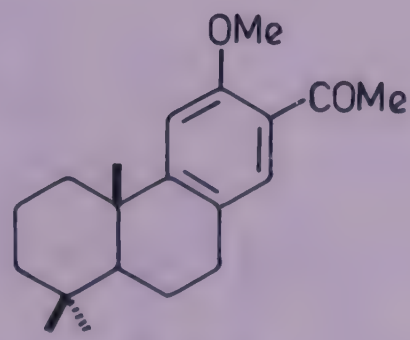
Nimbolicin



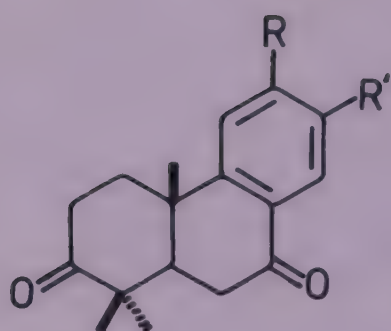
Nimbidiol



Nimosone



Nimbosone

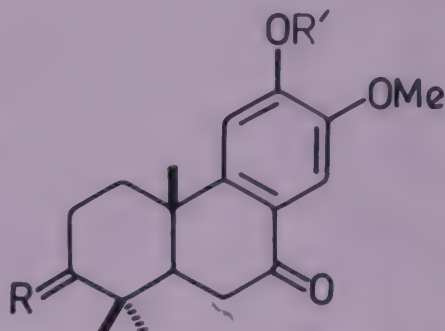


Nimbione

R = Me, R' = OH

Nimbinone

R = OH, R' = Me



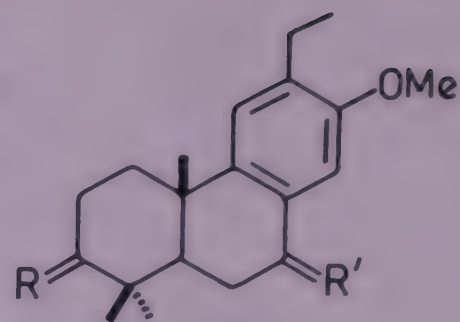
Nimbionone

R = O, R' = H

Methyl nimbionone

R = O, R' = Me

Nimbionol

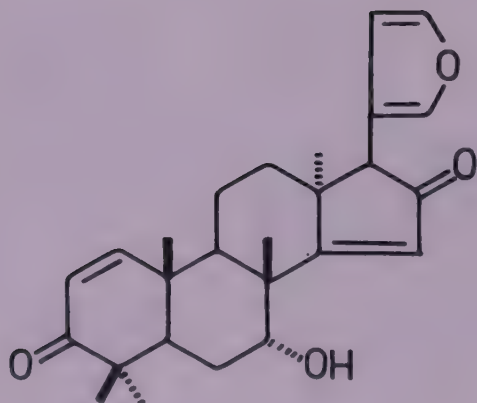
R = β -OH, H, R' = H

Nimbonone

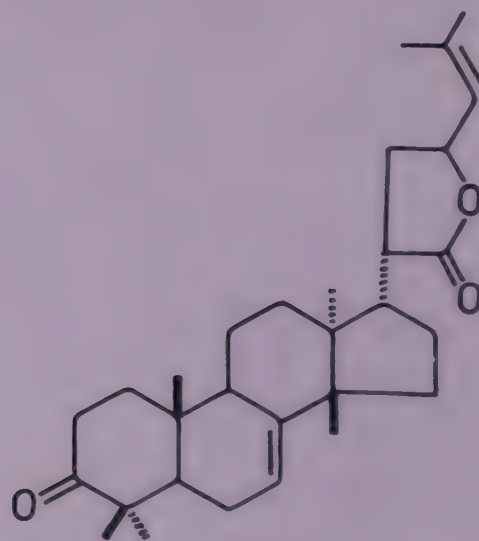
R = H, H, R' = O

Nimbonolone

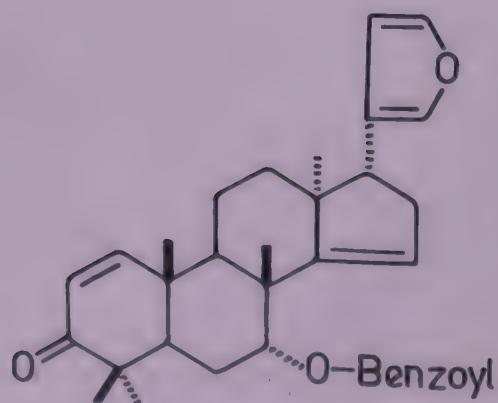
R = O, R' = H, H



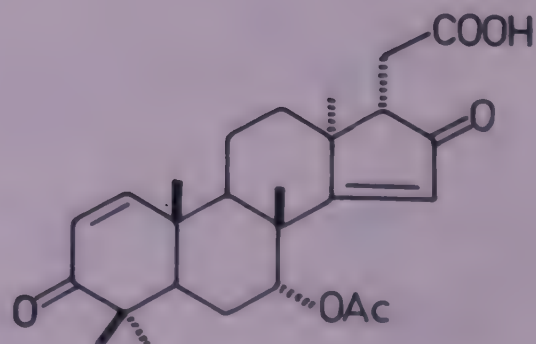
Nimbocinol



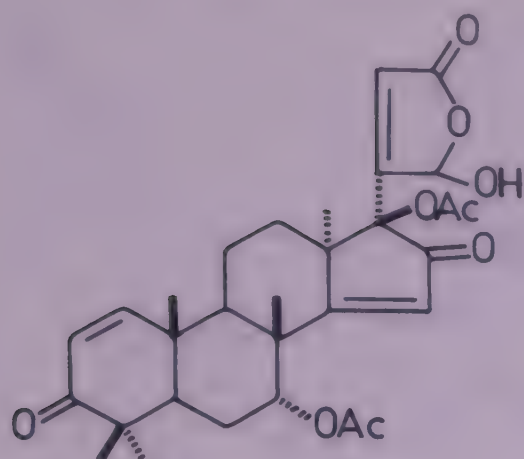
Nimolinone



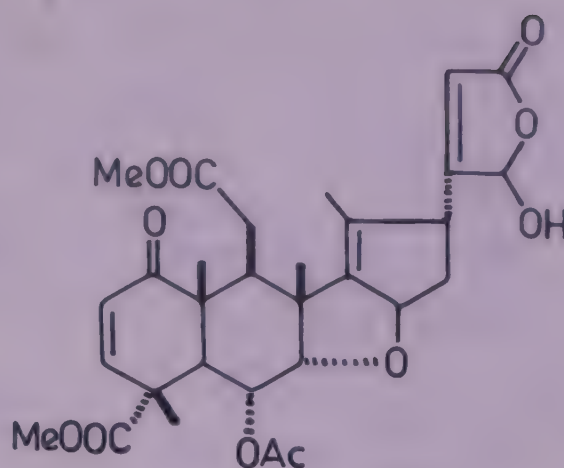
Nimocin



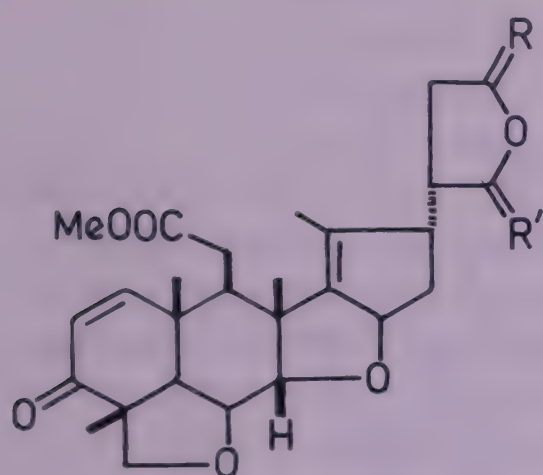
Nimolicinoic acid



Isonimolicinolide



Isonimbinolide

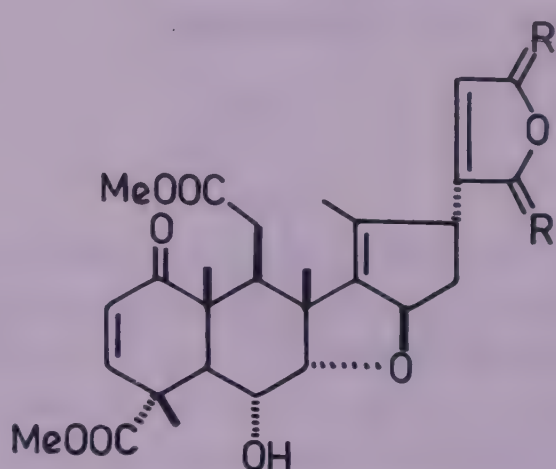


Margosinolide

$R = H, OH, R' = O$

Isomargosinolide

$R = O, R' = H, OH$

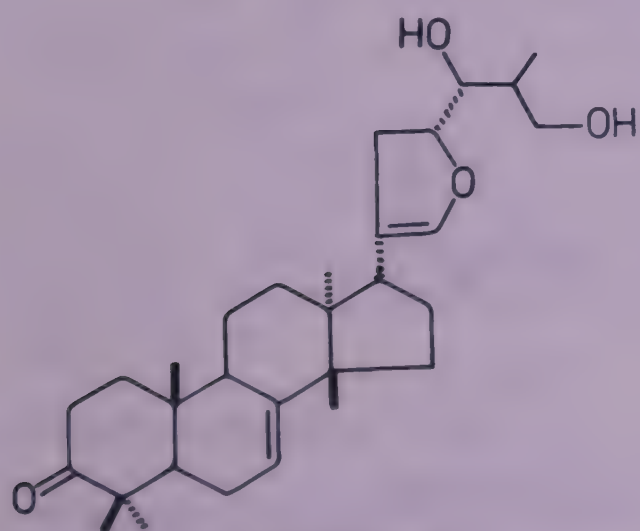


Desacetylnimbinolide

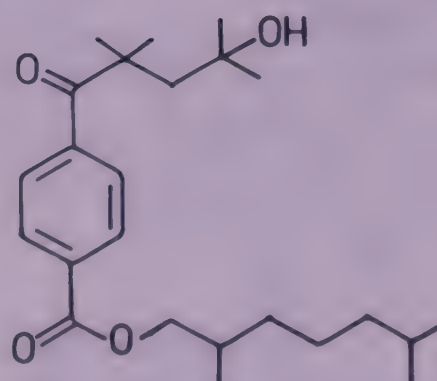
$R = O, R' = H, OH$

Desacetylonimbinolide

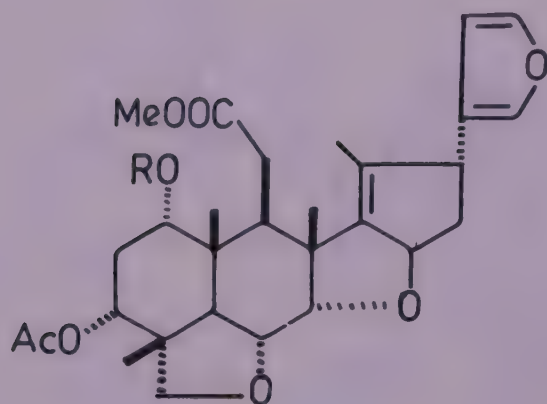
$R = H, OH, R' = O$



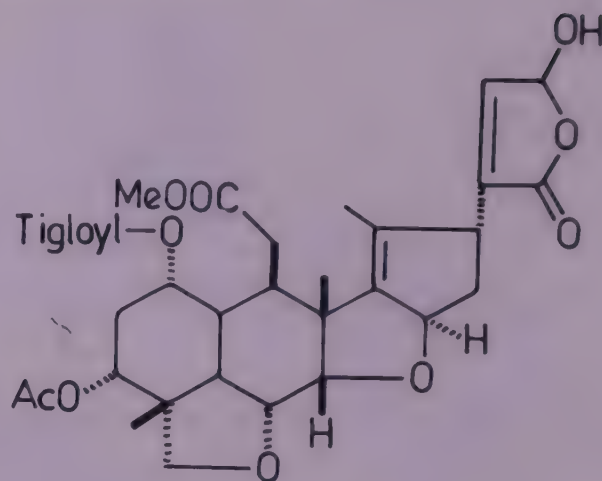
Nimbocinone



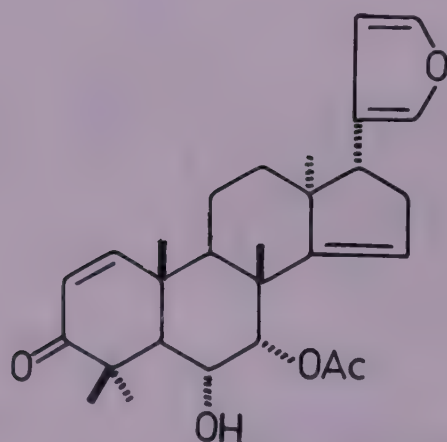
Nimbocetin



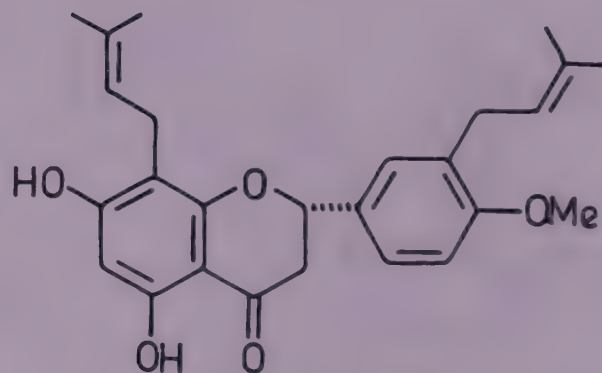
Salannol-3-acetate

R = COCH₂CHMe₂

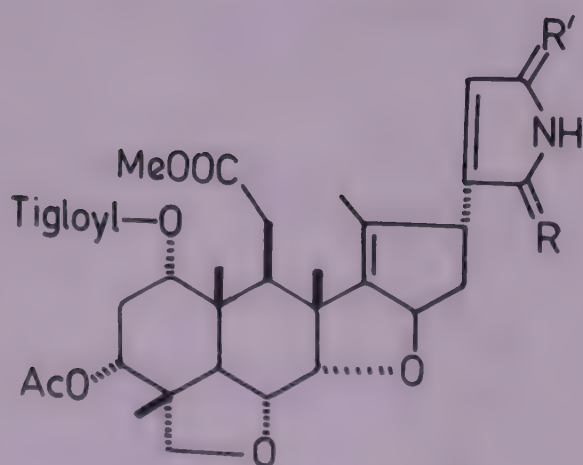
Solannolide



Nimocinol



Nimbaflavone

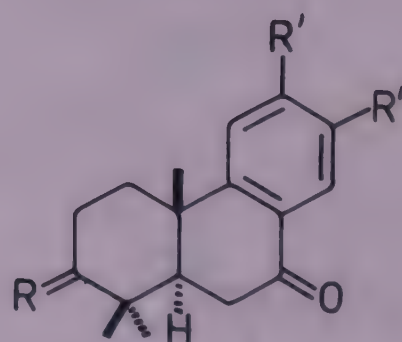


Salannolactam-(21)

R = O, R' = H, H

Salannolactam-(23)

R = H, H, R' = O



Margolone

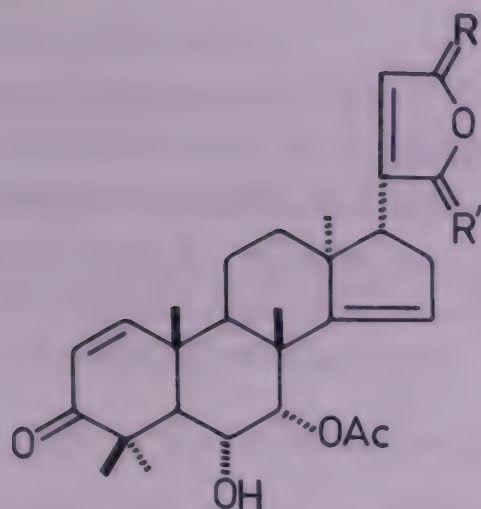
R = H, H, R' = Me, R'' = COOH

Margolonone

R = O, R' = Me, R'' = COOH

Isomargolonone

R = O, R' = COOH, R'' = Me

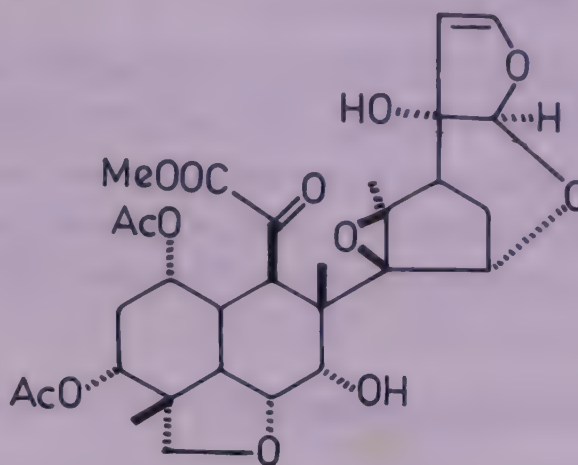


Nimocinolide

R = H, OH, R' = O

Isonimocinolide

R = O, R' = H, OH



I

BOIOLOGICAL ACTIVITY

Nimbidin (100.0 mg orally, three times a day) showed significant effect on psoriasis when given for 72 days to male aged 60 years having psoriatic lesions of 13 years duration (*J. Res. Ayurveda & Siddha* 1980, 1, 52); polysaccharide N9GI markedly inhibited growth of sarcoma 180 at dose of 25.0 mg/kg, i.p., for 10 days in mice (Jpn. 6,042,329 (1985) Mar. 06; *Chem. Abstr.* 1985, 103, 200865 t); nimocinolide and isonimocinolide acted as insect growth regulators against houseflies and mosquitoes (*J. Chem. Soc. Perkin 1* 1986, 1021); deacetylazadirachtinol, when fed in artificial diet to larvae of tobacco budworm, showed marked inhibition of insect ecdysis *Heliothis virescens* (*Tetrahedron* 1986, 42, 486); salannolactam-(21) and salannolactam-(23) showed antifeedant activity against Mexican bean beetle, *Epilachna varivestis* (*Ann. Chem.* 1987, 337); 7-deacetyl-17 β -hydroxyazadiradione inhibited growth of *Heliothis virescens* to greater extent than azadiradione and 7-deacetylazadiradione (*Phytochemistry* 1988, 27, 2773); polysaccharide CSP-I at a dose of 2.0 mg/kg showed 78.9% inhibition of sarcoma 180 in mice (*Chem. Pharm. Bull.* 1988, 36, 2654); di-n-propyldisulphide showed larvicidal activity against *Aedes aegypti*, *Heliothis virescens* and *H. zea* (*J. Agric. Food Chem.* 1988, 36, 1048; *Chem. Abstr.* 1988, 109, 125861 g); margolone, margolonone and isomargolonone showed antibacterial activity against various Gram-positive and Gram-negative organisms (*J. Chem. Soc. Perkin 1* 1989, 343).

AZIMA (Salvadoraceae)

A. tetraacantha Lam. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 90)

Isorhamnetin-3-O-rutinoside isolated from leaves (*Indian J. Chem.* 1988, 27B, 387).

BACOPA (Scrophulariaceae)

B. monnieri (L.) Wettst. syn. *Herpestis monniera* (L.) H.B. & K. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 88).

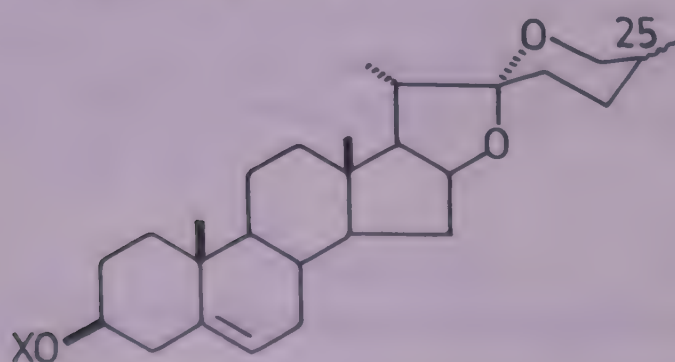
Treatment with plant extract for one month brought about reduction in level of anxiety, adjustment disability, leading to improved mental function. Levels of urinary V.M.A. and corticoids were also reduced. Thus, drug appeared to have anti-anxiety agent property (*J. Res. Ayurveda & Siddha* 1980, 1, 133).

BALANITES (Balanitaceae)

B. aegyptiaca (L.) Delile syn. *B. roxburghii* Planch. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 88).

Fruit pulp extract on i.v. administration produced a triphasic response which consisted of initial brief fall, followed by brief rise and then prolonged fall in blood pressure of anaesthetised dogs and cats. It exhibited contractile effect on nictitating membrane of anaesthetised cats, frog rectus abdominis muscle, rabbit intestine and guinea pig ileum *in vitro*. Purgative action was only seen at lethal doses in rats and mice; LD₅₀ in mice was 5.89 g/kg (oral) and 0.33 g/kg (i.p.) (*J. Res. Ayurveda & Siddha* 1986, 7, 47).

Diosgenin (1.26%) isolated from plant grown in Sudan (*Indian J. Pharm. Sci.* 1985, 47, 219); diosgenin content in leaves was lowest in May (0.05%) and highest in December (0.47%) (*Indian Drugs* 1986, 24, 49); two new saponins (I and II) characterised as 25(R) and 25(S) spirost-5-en-3 β -ol-3-O-[α -L-rhamnopyranosyl(1 \rightarrow 2)]-[β -D-glucopyranosyl(1 \rightarrow 3)- β -D-glucopyranosyl(1 \rightarrow 4)]- β -D-glucopyranoside respectively, present in stem bark in ratio of 1.5:1; deltonin and protodeltonin also isolated (*Phytochemistry* 1987, 26, 2223); quercetin-3-glucoside, -3-rutinoside, isorhamnetin-3-glucoside and isorhamnetin-3,7-diglucoside isolated from leaves and branches whereas isorhamnetin-3-rutinoside and -3-rhamnogalactoside isolated from leaves, branches and fruits (*Plant Syst. Evol.* 1988, 160, 153; *Chem. Abstr.* 1988, 109, 167351 w).

NEW COMPOUNDS

I

~~~~ = eq ( $\alpha$ )

II

~~~~ = ax ( $\beta$ )X = Glu[(2 $\rightarrow$ 1)Rha](4 $\rightarrow$ 1)Glu(3 $\rightarrow$ 1)Glu

BIOLOGICAL ACTIVITY

25(R)-, 25(S)-Spirost-5-en-3 β -ol-3-O-[α -L-rhamnopyranosyl(1 \rightarrow 2)]-[β -D-glucopyranosyl(1 \rightarrow 3)- β -D-glucopyranosyl(1 \rightarrow 4)]- β -D-glucopyranosides exhibited insect antifeedant activity (*Phytochemistry* 1987, 26, 2223).

B. roxburghii Planch.; see *B. aegyptiaca* (L.) Delile

BALSAMODENDRON (Burseraceae)

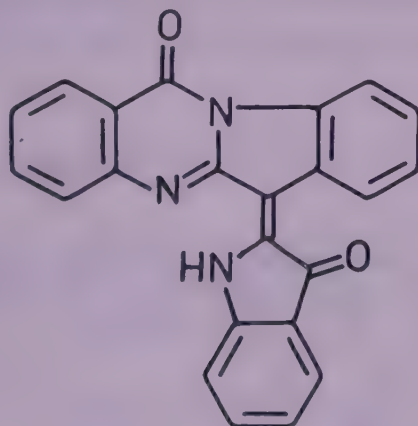
B. mukul Hook. ex Stocks; see *Commiphora wightii* (Arnott) Bhandari

BAPHICACANTHUS (Acanthaceae)

B. cusia (Nees) Bremek.

Isolation of new compound - qingdainone - along with tryptanthrin from leaves; its structure determination and synthesis (*Yaoxue Xuebao* 1985, 20, 45; *Chem. Abstr.* 1985, 103, 59147 b).

Distribution : North-east India.

NEW COMPOUNDS

Qingdainone

BIOLOGICAL ACTIVITY

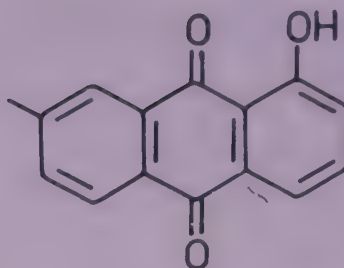
Qingdainone and tryptanthrin exhibited cytotoxic effect against melanoma B16 cells *in vitro*; qingdainone also active against Lewis lung carcinoma in mice (*Yaoxue Xuebao* 1985, 20, 45; *Chem. Abstr.* 1985, 103, 59147 b).

BARLERIA (Acanthaceae)

B. buxifolia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 33).

Isolation of barleriaquinone from roots and its structure determination (*Chem. Pharm. Bull.* 1984, 32, 4137).

NEW COMPOUNDS



Barleriaquinone

B. lupulina Lindl.

H. & Eng. - Barleria.

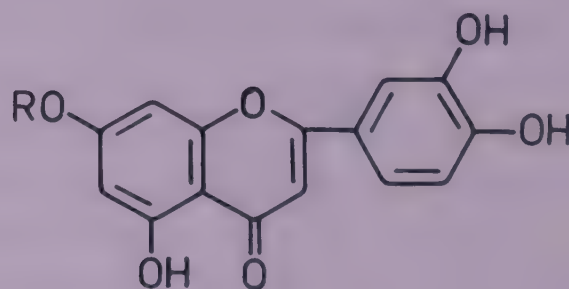
Shanzhiside methyl ester, barlerin and acetyl barlerin isolated from aerial parts (*J. Nat. Prod.* 1986, 49, 179).

Distribution : Introduced into India and grown in gardens.

B. prionitis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 90).

A new acylated flavonoid - luteolin-7-O-(2''-p-coumaroyl)- β -D-glucopyranoside - isolated from roots and its structure elucidated (*Natl. Acad. Sci. Lett.* 1984, 7, 187).

NEW COMPOUNDS



Luteolin-7-O-(2''-p-coumaroyl)-glucoside

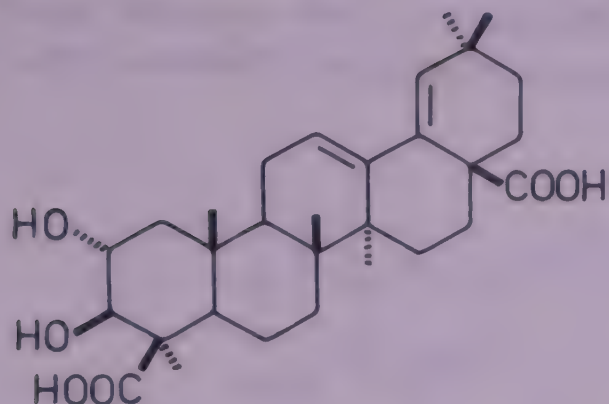
R = (2''-p-Coumaroyl)glucose

BARRINGTONIA (Barringtoniaceae)

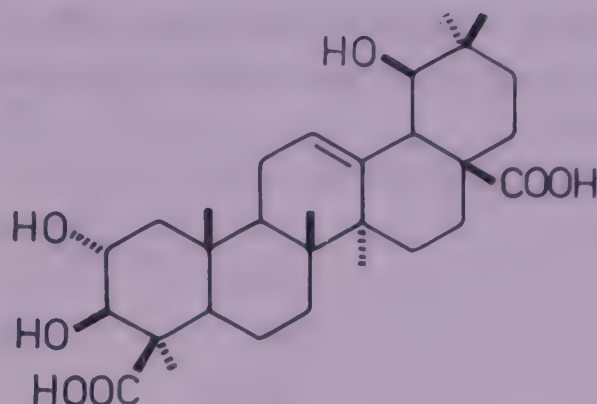
B. asiatica (L.) Kurz syn. *B. speciosa* J.R. & G. Forst. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 90).

Two new triterpene acids - anhydrobartogenic acid and 19-epibartogenic acid - along with bartogenic acid isolated from fruits and characterised (*Phytochemistry* 1984, 23, 2962; *Indian J. Chem.* 1986, 25B, 113).

NEW COMPOUNDS



Anhydrobartogenic acid



19-Epibartogenic acid

B. speciosa J.R. & G.Forst.; see *B. asiatica* (L.) Kurz

BASSIA (Sapotaceae)

B. butyracea Roxb.; see *Madhuca butyracea* (Roxb.) Macbride

B. latifolia Roxb.; see *Madhuca longifolia* (Koen.) Macbride

B. longifolia Koen.; see *Madhuca longifolia* (Koen.) Macbride

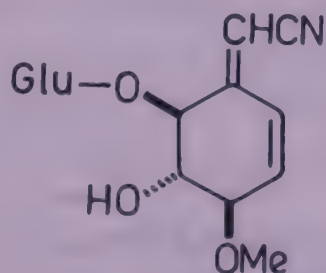
BAUHINIA (Caesalpinaceae)

B. championii Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 91).

Total flavonoids inhibited platelet aggregation, possessed coronary dilating activity, decreased cardiac inotropism but did not affect heart rate (*Prog. Clin. Biol. Res.* 1986, 213; *Chem. Abstr.* 1986, 105, 35165 w).

A new nitrile glucoside - bauhinin - along with gallic acid isolated from roots and characterised (*J. Nat. Prod.* 1985, 48, 933).

NEW COMPOUNDS

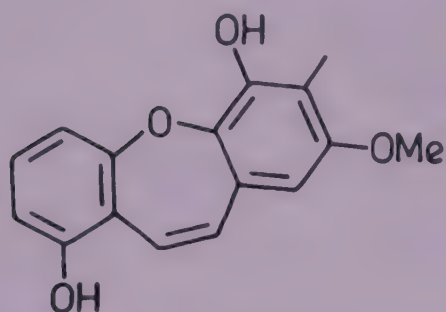


Bauhinin

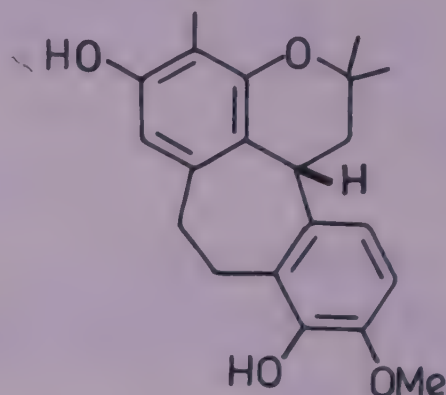
B. racemosa Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 92).

New dibenzo(2,3:6,7)oxepin derivative - pacharin - isolated from heartwood and its structure elucidated (*Tetrahedron* 1984, 40, 4245); isolation of new tetracyclic phenol - racemosol - from heartwood and its crystal structure determination (*Tetrahedron* 1986, 42, 2417).

NEW COMPOUNDS



Pacharin



Racemosol

B. vahlii Wt. & Arn. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 96).

Campesterol, stigmasterol, β -sitosterol, agathisflavone and its mono- and di-O-methyl derivatives, kaempferol, quercetin, its 3-glucoside and betulinic acid identified in leaves (*J. Indian Chem. Soc.* 1985, 62, 337).

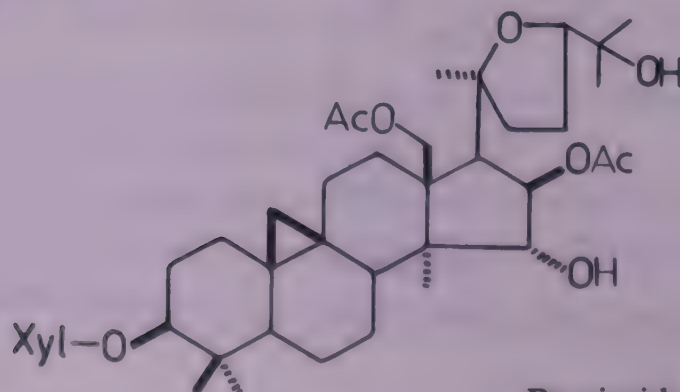
BEESIA (Ranunculaceae)

B. calthaefolia (Maxim. ex Oliver) Ulbrich

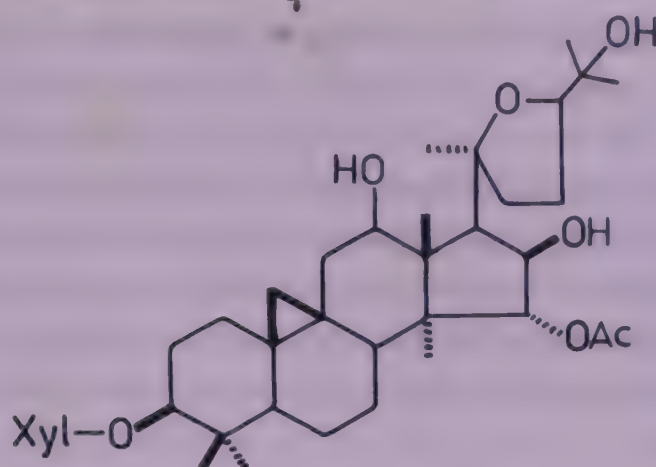
Four new 9,19-cyclolanostanol xylosides - beesiosides I, II, III and IV - isolated from rhizomes and beesioside III characterised as 15 α -acetoxy-20 ζ ,24 ζ -epoxy-9,19-cyclolanostane-3 β ,12 β ,16 β ,25-tetraol-3-O- β -xylopyranoside (*Phytochemistry* 1985, 24, 1329); isolation and structure determination of beesioside II from rhizomes; structure confirmed by X-ray analysis (*Chem. Pharm. Bull.* 1986, 34, 582).

Distribution : Arunachal Pradesh.

NEW COMPOUNDS



Beesioside II



Beesioside III

BENTHAMIDIA (Cornaceae)

B. capitata (Wall.) Hara syn. *Cornus capitata* Wall. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 97).

n-Hentriacontane, 7-hydroxycadalene, triacontanol, stigmastanone, lupeol, triacontanoic acid, tetracosanoic acid, friedelin, betulin, epibetulin and betulinic, epibetulinic, maslinic, arjunolic and gallic acids, sitosterol, its glucoside, phloroglucinol and smilagenin isolated from stems (*J. Nat. Prod.* 1986, 49, 714); two new triterpenes isolated from stem bark and characterised as 21,23-epoxytirucalla-7,24-diene-3-one and 3 β -acetoxy-21,23-epoxytirucalla-7,24-diene (*Phytochemistry* 1987, 26, 2607); isolation and characterisation of a new triterpene - 3 α -acetoxy-2 β -hydroxylupan-28,13 β -olide - from stem (*Indian J. Pharm. Sci.* 1988, 50, 332); 3 β -acetoxy-23(or 24)-oxo-lup-20(29)-ene and dotriacontanyl octacosanoate isolated from stems along with oleanolic and acetyloleanolic acids (*Fitoterapia* 1988, 59, 45).

BERBERIS (Berberidaceae)

B. aristata Hook.f. & Thoms; see *B. chitria* Lindl.

B. brandisiana Ahrendt

New alkaloid - (+)berbamine-2'- β -N-oxide - isolated along with berberine, palmatine, (+)berbamine, thalifoline, (+)reticuline, (+)apoglaziovine, (+)isoboldine and (+)isotetrandrine; structure of (+)berbamine-2'- β -N-oxide elucidated (*J. Nat. Prod.* 1986, 49, 538). Distribution : Kashmir and Himachal Pradesh, alt. 2400-3500 m.

B. chitria Lindl. syn. *B. aristata* sensu Hook.f. & Thoms. p.p.

H. - Daru haldi; S. - Daru haridra; Garhwal - Chitri; Trade - Rasaut, Rasot.

Root extract showed CNS depressant activity in albino mice and antimicrobial activity against *Escherichia coli*, *Staphylococcus aureus*, *Bacillus proteus*, *Salmonella typhi* and *Pseudomonas pyocyanae* (*Himalayan Chem. Pharm. Bull.* 1988, 5, 41; *Chem. Abstr.* 1989, 110, 54463 m).

DIR-435

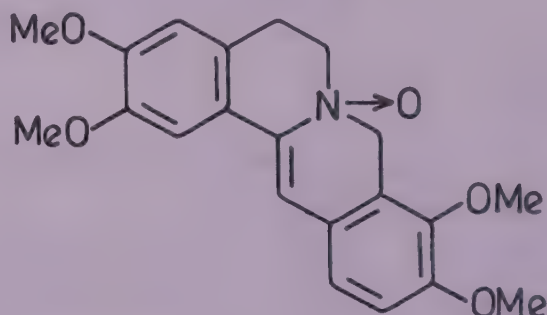
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Isolation and characterisation of a new aporphine base - O-methylcorydine N-oxide - along with berberine, palmatine, jatrorrhizine and oxyacanthine (*Phytochemistry* 1985, 24, 633); hentriacontane, triacontane, cetyl alcohol, β -sitosterol, γ -sitosterol, dihydrokaempferol, quercetin and oleic, stearic, palmitic and linoleic acids isolated from roots; three alkaloids - chitrians A, B and C - also isolated (*Himalayan Chem. Pharm. Bull.* 1988, 5, 41; *Chem. Abstr.* 1989, 110, 54463 m); isolation and structure elucidation of a new alkaloid - dihydropalmatine N-oxide - from roots (*Pharmazie* 1989, 44, 510; *Chem. Abstr.* 1989, 111, 191522 q).

Distribution : Himalayas, from Kashmir to Bhutan, alt. 1600-3700 m.

NEW COMPOUNDS



Dihydropalmatine N-oxide

B. lycium Royle (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 94).

¹³C-NMR studies on berberine (*Heterocycles* 1988, 27, 911).

BIOLOGICAL ACTIVITY

Berberine (1.0 mg/kg, i.v.) elevated ventricular fibrillation threshold to electrical stimulation in anaesthetised cats. In isolated guinea pig papillary muscle berberine treatment increased duration of action potential and effective refractory period and increased isometric contractile force, but had no effect on resting potential (*Zhongguo Yaoli Xuebao* 1986, 7, 321; *Chem. Abstr.* 1986, 105, 72380 h); berberine (0.1-300 μ M) induced concentration-dependent positive inotropic and negative chronotropic actions in isolated guinea pig atria and papillary muscle. It also prolonged functional refractory period and inhibited adrenaline-induced abnormal automaticity but did not affect excitability of heart muscle (*Zhongguo Yaoli Xuebao* 1987, 8, 220; *Chem. Abstr.* 1987, 107, 17575 s); it antagonised hyperglycaemic action of glucose injection and inhibited gluconeogenic action of alanine injection (*Yaoxue Xuebao* 1987, 22, 161; *Chem. Abstr.* 1987, 107, 650 q); berberine sulphate at 40.0 and 80.0 mg/kg, p.o., reduced purging effect of castor oil in mice but did not affect gastrointestinal transport of Chinese ink in normal mice. It inhibited increased vascular permeability induced by AcOH and histamine in mice and rats. It also inhibited xylene-induced swelling of mouse ear and the anti-inflammatory effect was dose-dependent (*Zhongguo Yaoli Xuebao* 1989, 10, 174; *Chem. Abstr.* 1989, 110, 165918 h).

B. orthobotrys Bien. ex Aitch. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 96).

BIOLOGICAL ACTIVITY

In isolated atria of guinea pig, berbamine markedly inhibited force of contraction, prolonged effective refractory period and attenuated adrenaline-induced automaticity. Berbamine, like verapamil, antagonised effect of isoproterenol and shifted concentration-response curve of Ca^{2+} to the right, acting as a noncompetitive antagonists; it also antagonised effect of histamine on atria (Yaoxue Xuebao 1985, 20, 859; *Chem. Abstr.* 1986, 104, 199836 w); berbamine (5.0 mg/kg, i.v.) decreased size of myocardial infarction in coronary artery ligation in both rabbits and rats; it also inhibited increase in serum free fatty acids after ligation. Thus, it protected animals against experimental myocardial infarction (*Zhongguo Yaoli Xuebao* 1986, 7, 231; *Chem. Abstr.* 1986, 105, 18097 h); berbamine inhibited contractility and automaticity of isolated guinea pig papillary muscle and human pectinate muscle. It also prolonged functional refractory period of these muscles but showed no effect on excitability. It antagonised positive inotropic action of isoproterenol and histamine on guinea pig papillary muscle but kinetics was different from that of propandol and cemitidine (*Zhongguo Yaoli Xuebao* 1986, 7, 222; *Chem. Abstr.* 1986, 105, 18095 f); i.p. injection of berbamine in mice inoculated with influenza virus enhanced phagocytic activity of alveolar macrophages and intracellular bactericidal activity and phagosome lysosome fusion in lung, indicating a possible immunostimulant action of berbamine (*Zhongguo Yaoli Xuebao* 1986, 7, 475; *Chem. Abstr.* 1986, 105, 202881 k).

B. pseudoumbellata Parker

Oxyacanthine and its O-methyl ether, berberine, palmatine, 10-nonacosanol, β -sitosterol and its β -D-glucoside isolated (*Fitoterapia* 1986, 57, 427).

Distribution : Himachal Pradesh, alt. 1200-2700 m.

B. vulgaris L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 96).

Cyanidin-3-glucoside, peonidin-3-glucoside and petunidin-3-glucoside and glycosides of cyanidin, pelargonidin, petunidin, peonidin and delphinidin containing glucose and rutinose identified in fruits (*Khim. Pri. Soedin.* 1985, 569; *Chem. Abstr.* 1986, 104, 165307 j).

BERGENIA (Saxifragaceae)

B. purpurascens (Hook.f. & Thoms.) Engl. syn. *Saxifraga purpurascens* Hook.f. & Thoms.

Two new polyphenols - 4,6-di-O-galloylarbutin and 2,4,6-tri-O-galloylglucose - isolated from roots along with 6-O-galloylarbutin, bergenin and its gallates; structures of new compounds elucidated (*Phytochemistry* 1987, 26, 515).

Distribution : Himalayas from Nepal to Arunachal Pradesh, alt. 3000-5000 m.

BETA (Chenopodiaceae)

B. vulgaris L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 37).

Phytoalexins - 3,5-dihydroxy-6,7-methylenedioxyflavanone, 5,2'-dihydroxy-6,7-methylenedioxyisoflavone and 5-hydroxy-6,7-methylenedioxyflavone - isolated from roots infected with *Rhizoctonia solani* (*Bull. Chem. Soc. Jpn.* 1987, 60, 2261).

BIGNONIA (Bignoniaceae)

B. gracilis Lodd.; see *B. unguis-cati* L.

B. megapotamica Spreng. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 101).

Caffeic, p-coumaric and p-hydroxybenzoic acids isolated from leaves (*Indian J. Chem.* 1985, 24B, 453).

B. unguis-cati L. syn. *B. gracilis* Lodd. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 101).

Lapachol, ceryl alcohol, β -amyirin and β -sitosterol isolated from aerial parts (*J. Nat. Prod.* 1985, 48, 145); isolation of octacosanol, tectol and ellagic acid (*J. Indian Chem. Soc.* 1987, 64, 129).

BIOTA (Cupressaceae)

B. orientalis Endl.; see *Thuja orientalis* L.

BISCHOFIA (Euphorbiaceae)

B. javanica Blume (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 101).

Identification of friedelin, friedelinol, epifriedelinol, β -sitosterol and its glucoside in stems (*Zhongcaoyao* 1987, 18, 250; *Chem. Abstr.* 1987, 107, 172507 q); n-triacontane, β -amyirin, friedelin, ursolic acid, chrysoeriol, fisetin, quercetin, luteolin-7-O-glucoside, quercitrin and β -sitosterol isolated (*Pharmazie* 1988, 43, 222; *Chem. Abstr.* 1988, 109, 89781 v); betulinic acid, friedelinol acetate, (+)roxburgholone and hentriacontane present in leaves (*Zhongcaoyao* 1989, 20, 249, 287; *Chem. Abstr.* 1989, 111, 228964 p).

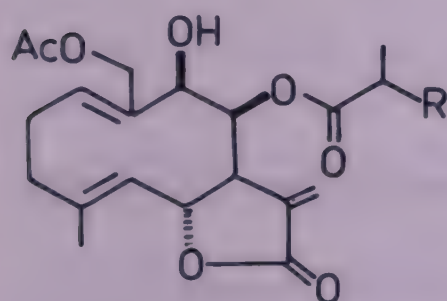
BIOLOGICAL ACTIVITY

Betulinic acid inhibited growth of P-388 leukaemia cell line (*Zhongcaoyao* 1989, 20, 249, 287; *Chem. Abstr.* 1989, 111, 228964 p).

BLAINVILLEA (Asteraceae)

B. acmella (L.) Philip. syn. *B. latifolia* (L.f.) DC. ex Wight (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 101).

Eleven new sesquiterpene lactones - 9 β -hydroxyovatifolin-8-O-[2-methylbutyrate] (I), desacetyl-11 β ,13-dihydroovatifolin (II), desacetyl-11 β ,13-dihydroovatifolin-8-O-tiglate (III), desacetyl-11 β ,13-dihydroovatifolin-8-one (IV), 8 β -hydroxy-9 β -[2-methylbutyryloxy]-14-oxoacanthospermolide (V), 8 β -hydroxy-14-oxo-11 β ,13-dihydroacanthospermolide (VI) and its 8-acetyl (VII), 8-tigloyl (VIII), 8-[2-methylbutyryl] (IX) derivatives, 8,14-dioxo-11 β ,13-dihydroacanthospermolide (X) and 8,14-dioxo-7,11-dehydro-11,13-dihydroacanthospermolide (XI) - isolated from aerial parts together with deacetylovatifolin, deacyl grazielic acid tiglate, 8 β -[2-methylbutyryloxy]-9 β -hydroxy-14-oxoacanthospermolide, ovatifolin, two thiophenacetylenes and two daucane derivatives from roots; structures of new compounds established (*Phytochemistry* 1985, 24, 2023); substance (I) and a related lactone (XII) isolated; their structures elucidated by ¹³C-NMR spectroscopy and confirmed by X-ray analysis (*J. Chem. Res., Synop.* 1986, 272; *Chem. Abstr.* 1987, 106, 15702 m); isolation of a new guaianolide - 5-desoxypumilin - and a new geranylnerol derivative - 18-acetoxy-12,19-dihydroxygeranylnerol - from aerial parts along with subacaulin, zoapatanolides A and B, phytol, β -sitosterol and stigmasterol; structures of new compounds elucidated (*Phytochemistry* 1988, 27, 609).

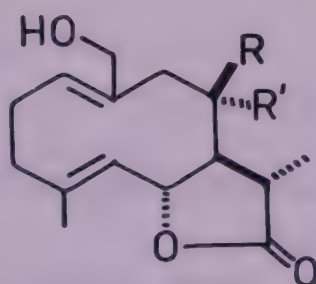
NEW COMPOUNDS

I

R = Et

XII

R = Me



II

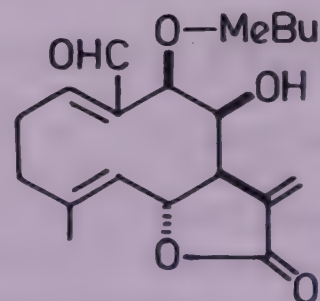
R = OH, R' = H

III

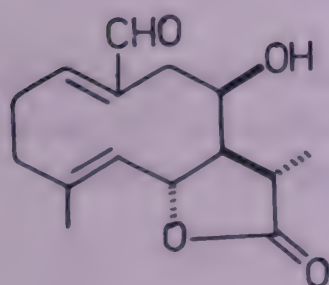
R = Tigloyloxy, R' = H

IV

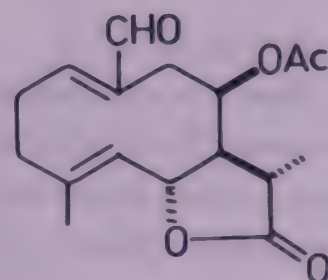
R, R' = O



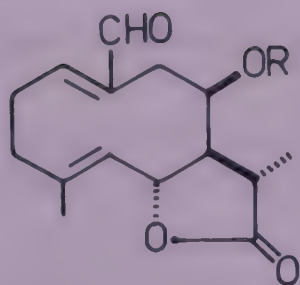
V



VI



VII

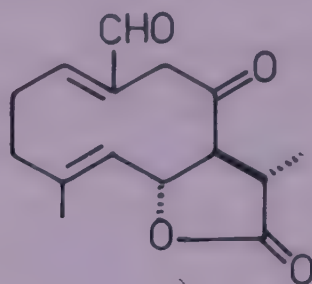


VIII

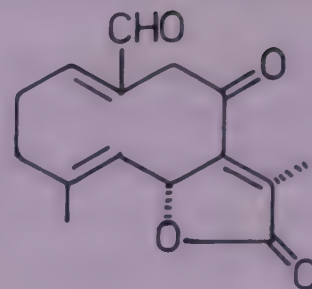
R = Tigloyl

IX

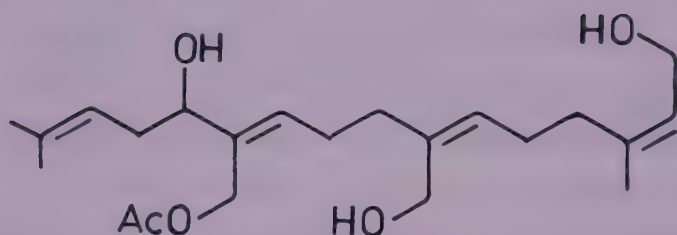
R = 2-Me Butyryl



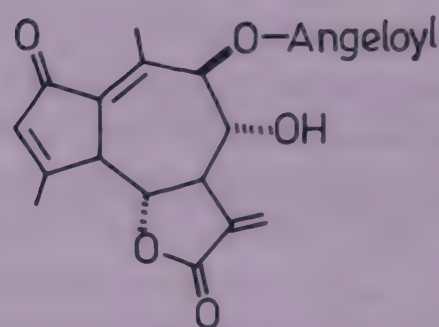
X



XI



18-Acetoxy-12,19-dihydroxygeranylnerol

B. latifolia (L.f.) DC. ex Wight; see *B. acmella* (L.) Philip.

5-Desoxypumilin

BLEPHARIS (Acanthaceae)*B. linariaefolia* Pers.; see *B. sindica* T. Anders.*B. sindica* T. Anders. syn. *B. linariaefolia* Pers. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 97).

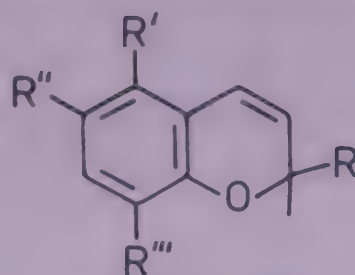
Betaine, allantoin, oleanolic acid, apigenin, terniflorin, prunin-6''-o-coumarate, blepharin and β -sitosterol isolated from seeds (*J. Chem. Soc. Pak.* 1984, 6, 217; *Chem. Abstr.* 1985, 103, 3663 z); isolation of allantoin and n-hentriacontane from seeds (*Pakistan J. Sci. Ind. Res.* 1989, 32, 162; *Chem. Abstr.* 1989, 111, 212012 r).

BLEPHARISPERMUM (Asteraceae)*B. subsessile* DC.

Four new chromenes - (-)artemesinol, desmethylisoencecalin, 8-methoxy-2,2-dimethylchromene (I) and 5-hydroxy-6-acetyl-2-hydroxymethyl-2-methylchromene (II) - isolated and characterised; desmethoxyencecalin also isolated (*Phytochemistry* 1987, 26, 2969).

Distribution : Western Ghats.

NEW COMPOUNDS



(-)Artemesinol

 $R = \beta\text{-CH}_2\text{OH}$, $R', R''' = \text{H}$, $R'' = \text{Ac}$

Desmethyloencecalin

 $R = \text{Me}$, $R' = \text{OH}$, $R'' = \text{Ac}$, $R''' = \text{H}$

I

 $R = \text{Me}$, $R', R'' = \text{H}$, $R''' = \text{OMe}$

II

 $R = \text{CH}_2\text{OH}$, $R' = \text{OH}$, $R'' = \text{Ac}$, $R''' = \text{H}$

BIOLOGICAL ACTIVITY

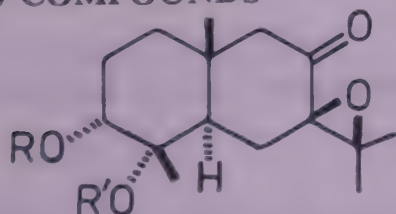
Desmethoxyencecalin showed oviposition deterrent activity against potato tuber moth, *Phthorimaea operculella* (*Phytochemistry* 1987, 26, 2969).

BLUMEA (Asteraceae)

B. alata (D. Don) DC. syn. *Laggera alata* (D. Don) Sch.- Bip. ex Oliver (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 149).

Seven cuauthemone sesquiterpenoids - $7\beta, 11$ -epoxycuauthemone-3-O-angelate (I) and its 4-O-acetyl derivative (II), $7\beta, 11$ -epoxycuauthemone-3-O-epoxyangelate (III) and its 4-O-acetyl derivative (IV) as well as 4-O-acetyl derivatives of 7α -hydroperoxy-11,13-dehydro-7,11-dihydrocuauthemone-3-O-angelate (V), 11-hydroperoxy-6,7-dehydro-7,11-dihydrocuauthemone-3-O-angelate (VI) and cuauthemone-3-O-[2-methyl-2-hydroxy-3-acetoxybutyrate] (VII) - isolated from aerial parts along with α -humulene, caryophyllene and squalene; structures of new compounds elucidated (*Phytochemistry* 1985, 24, 505).

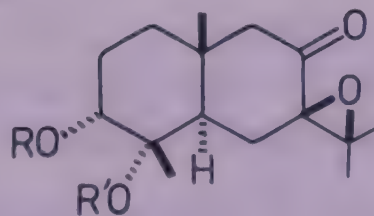
NEW COMPOUNDS



I

 $R = \text{Angeloyl}$, $R' = \text{H}$

II

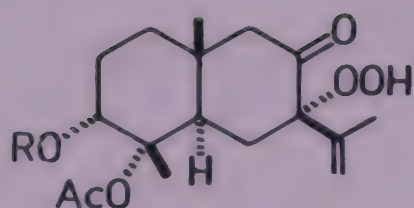
 $R = \text{Angeloyl}$, $R' = \text{Ac}$ 

III

 $R = \text{Epoxyangeloyl}$, $R' = \text{H}$

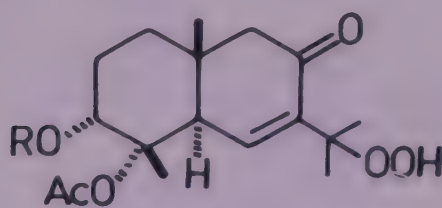
IV

 $R = \text{Epoxyangeloyl}$, $R' = \text{Ac}$



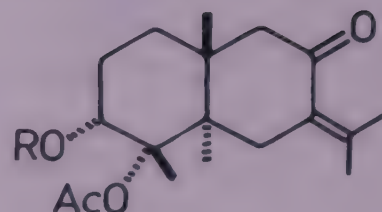
V

R = Angeloyl

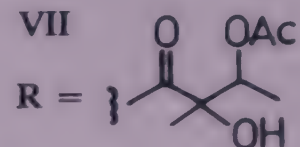


VI

R = Angeloyl



VII



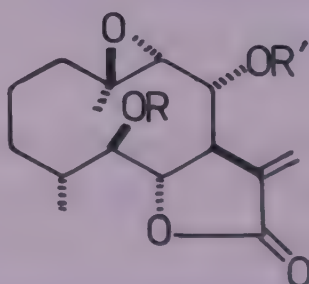
R =

B. amplexans DC. var. *arenaria* (DC.) Hook.f.; see *B. obliqua* (L.) Druce

B. balsamifera (L.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 97).

Cryptomeridiol isolated from leaves (*J. Sci. Soc. Thailand* 1985, 11, 47; *Chem. Abstr.* 1985, 103, 85129 s); a new flavone - 5,3',5'-trimethoxydihydroflavone isolated (*Zhongshan Daxue Xuebao, Ziran Kexueban* 1988, 77; *Chem. Abstr.* 1989, 110, 21073 f); isolation and characterisation of three new sesquiterpene lactones - blumealactones A, B and C from leaves (*Phytochemistry* 1988, 27, 1109).

NEW COMPOUNDS



Blumealactone A

R = H, R' = Tigloyl

Blumealactone B

R = H, R' = Angeloyl

Blumealactone C

R = Ac, R' = H

BIOLOGICAL ACTIVITY

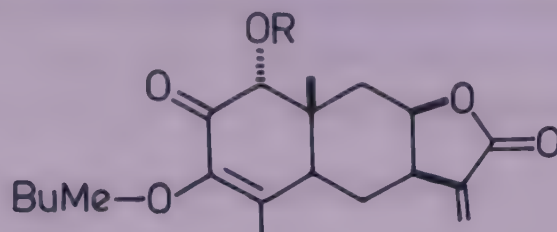
Blumealactones A, B and C exhibited antitumor activity against Yoshida sarcoma cells in tissue culture (*Phytochemistry* 1988, 27, 1109).

B. densiflora (Wall.) DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 38).

Tagitinin A, tirotundin ethyl ether and six new isoalantolactone derivatives - 1 α -hydroxy-3 α -(2-methylbutyryloxy)isoalantolactone, 1 α -hydroxy-3 α -isobutyryloxyisoalantolactone, 1 α ,

2 α -dihydroxy-3 α -(2-methylbutyryloxy)-isoalantolactone, 1 α -acetoxy-2-hydroxy-3 α -(2-methylbutyryloxy)isoalantolactone, 1 α ,3 α -dihydroxy-2 α -(2-methylbutyryloxy)-isoalantolactone and 1 α -acetoxy-3 α -hydroxy-2 α -(2-methylbutyryloxy)-isoalantolactone as well as 1 α -hydroxy-3-(2-methylbutyryloxy)pinnatifidin (I) and its 1-acetyl derivative (II) - isolated and structures of new compounds elucidated (*Phytochemistry* 1985, 24, 1509).

NEW COMPOUNDS



I

R = H

II

R = Ac

B. lanceolaria (Roxb.) Druce var. *lanceolaria* syn. *B. myriocephala* DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 102).

Chrysanthenone isolated from essential oil (*Fitoterapia* 1984, 55, 183).

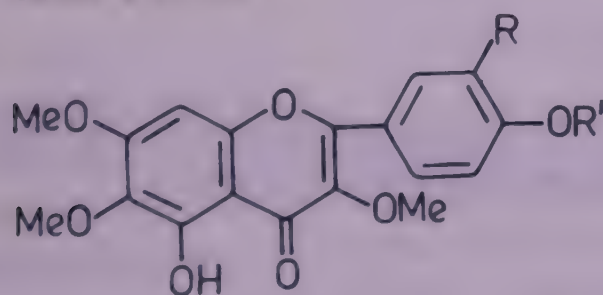
B. leucanthema DC.; see *Conyza leucantha* (D.Don) Ludlow & Raven

B. malcomii (Clarke) Hook.f.

Four new flavonols isolated and their structures proposed (*Phytochemistry* 1987, 26, 2079); proposed structures of these flavonols revised as 5-hydroxy-3,6,7,4'-tetramethoxyflavone (I), 5,3',4'-trihydroxy-3,6,7-trimethoxyflavone (II), 5,4'-dihydroxy-3,6,7,3'-tetramethoxyflavone (III) and 5-hydroxy-3,6,7,3',4'-pentamethoxyflavone (IV) (*Phytochemistry* 1989, 28, 243).

Distribution : Maharashtra, Karnataka and Kerala.

NEW COMPOUNDS

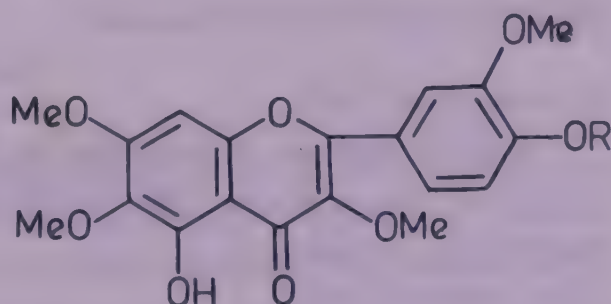


I

R = H, R' = Me

II

R = OH, R' = H



III

R = H

IV

R = Me

B. membranacea* DC. var. *membranacea

Essential oil produced long lasting fall in blood pressure in anaesthetised dogs. It exerted direct depressant action on frog heart and spasmolytic effect on rabbit ileum. It also depressed conditioned avoidance response, adversely affected rotarod performance and potentiated pentobarbitone-induced hypnosis in rats (*Indian J. Physiol. Pharmacol.* 1986, 30, 149).

Estimation of β -caryophyllene (23.08), its oxide (6.36), β -octanone (8.0), 2,3-dimethoxy-p-cymene (5.9) and δ -cadinene (3.8%) as major components in essential oil (*Indian Perfum.* 1987, 31, 231; *Chem. Abstr.* 1988 109, 146354 j).

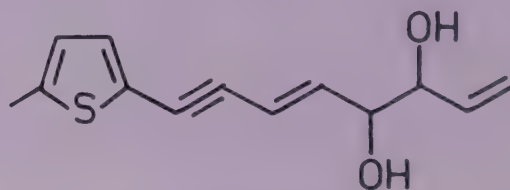
Distribution : Throughout plains of India.

B. myriocephala DC.; see *B. lanceolaria* (Roxb.) Druce var. *lanceolaria*

B. obliqua (L.) Druce syn. *B. amplexans* DC. var. *arenaria* (DC.) Hook.f.

A new acetylenic thiophene diol - amplexol - isolated from aerial parts and characterised; taraxasteryl acetate, dihydrosterculic acid and ferutinol also isolated (*Planta Med.* 1987, 53, 103).

Distribution : Throughout India in plains.

NEW COMPOUNDS

Amplexol

BOEHMERIA (Urticaceae)

B. platyphylla D.Don (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 98).

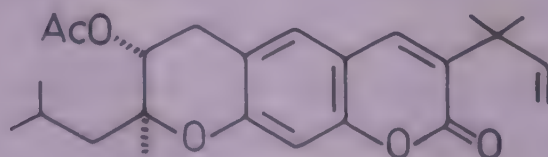
Total synthesis of julandine and cryptopleurine (*J. Org. Chem.* 1988, 53, 3325).

BOENNINGHAUSENIA (Rutaceae)

B. sessilicarpa Levell

A new compound - shijiaocaolactone A - isolated along with rutamarin and its structure elucidated (*Yaoxue Xuebao* 1989, 24, 260; *Chem. Abstr.* 1989, 111, 130761 v).

Distribution : Meghalaya.

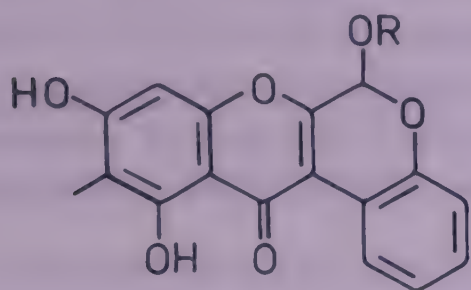
NEW COMPOUNDS

Shijiaocaolactone A

BOERHAVIA (BOERHAAVIA) (Nyctaginaceae)

B. diffusa L. syn. *B. repens* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 98).

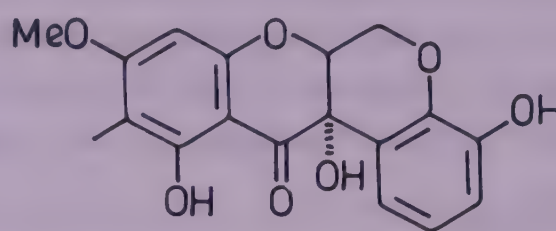
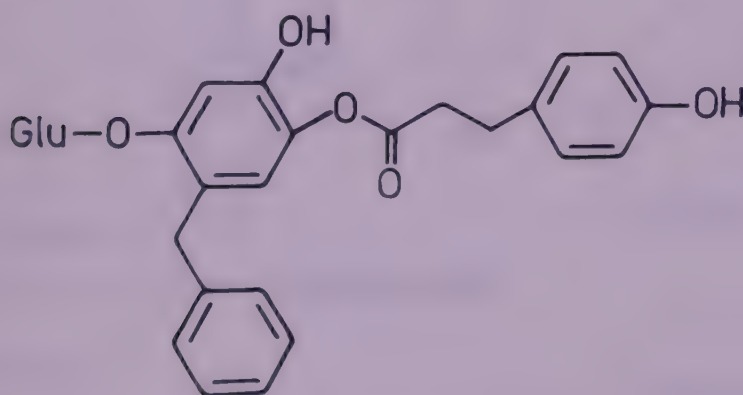
A purine nucleoside - hypoxanthine-9-arabinofuranoside - isolated from roots (*Fito-terapia* 1985, 56, 31); two new rotenoids - boeravinones A and B - isolated from roots and their structures determined (*Chem. Pharm. Bull.* 1988, 36, 834); isolation and structure elucidation of boeravinone C from roots (*Chem. Pharm. Bull.* 1988, 36, 2289); a new antifibrinolytic agent - punarnavoside - isolated from roots and characterised (*Indian J. Chem.* 1989, 28B, 163).

NEW COMPOUNDS**Boeravinone A**

R = Me

Boeravinone B

R = H

**Boeravinone C****Punarnavoside****BIOLOGICAL ACTIVITY**

Hypoxanthine-9-arabinofuranoside produced depressor and negative chronotropic effects in rats and cats; it also produced negative chronotropic and inotropic responses in guinea pig isolated atrial muscle (*Fitoterapia* 1985, 56, 31); punarnavoside at oral dose of 25.0 mg/kg for seven days stopped IUCD-associated bleeding episodes in rhesus monkey (*Indian J. Chem.* 1989, 28B, 163).

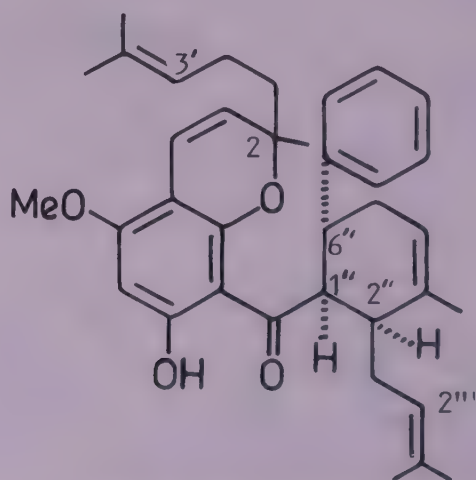
B. repens L.; see *B. diffusa* L.

BOESENBERGIA (Zingiberaceae)

B. pandurata (Roxb.) Schltr.; see *B. rotunda* (L.) Mansf.

B. rotunda (L.) Mansf. syn. *Curcuma rotunda* L., *Boesenbergia pandurata* (Roxb.) Schltr., *Kaempferia pandurata* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 99).

Panduratin B isolated as gum from red rhizomes found to be diastereomeric mixture of panduratin B1 and panduratin B2 which were characterised as (2RS,1''RS,2''SR,6''RS)- and (2RS,1''SR,2''RS,6''SR)-[7-hydroxy-5-methoxy-2-methyl-2-(4'-methylpent-3'-enyl)-2H-chromen-8-yl] and [3''-methyl-2''-(3'''-methylbut-2'''-enyl)-6''-phenylcyclohex-3''-enyl] methanone respectively; structure of panduratin B confirmed by synthesis (*Aust. J. Chem.* 1987, 40, 455); 3,5,7,3',4'-pentamethoxyflavone, 3,5,7,4'-tetramethoxyflavone, 5-hydroxy-7,4'-dimethoxyflavanone, 2'-hydroxy-4',6'-dimethoxychalcone and 2'-hydroxy-4,6,4'-trimethoxychalcone isolated from black rhizomes (*J. Sci. Soc. Thailand* 1987, 13, 119; *Chem. Abstr.* 1988, 108, 164763 w).

NEW COMPOUNDS

Panduratin B

BIOLOGICAL ACTIVITY

Dihydrotectochoresin (p.o.) showed significant dose-dependent antiphlogistic activity against carrageenin-induced paw oedema in Wistar rats. At 40.0 mg/kg it showed about 50.0% of the effect produced by phenylbutazone at 60.0 mg/kg. Antinociceptive action of dihydrotectochoresin at 50.0 mg/kg on 1,4-naphthoquinone-induced writhing in mice was about the same as produced by 50.0 mg/kg acetylsalicylic acid (*Acta Pharm. Indones.* 1986, 11, 82; *Chem. Abstr.* 1987, 107, 146984 y).

BOMBAX (Bombacaceae)

B. ceiba L. syn. *Salmalia malabarica* (DC.) Schott & Endl., *Bombax malabaricum* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 100).

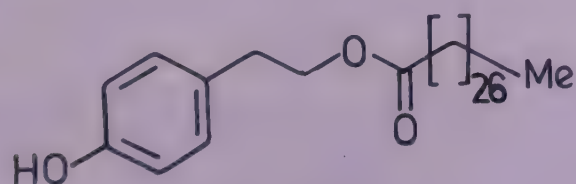
Lysine, arginine, alanine, glutamic acid, leucine, fructose, glucose, galactose, sucrose, lactose and arabinose isolated (*Pakistan J. Sci. Ind. Res.* 1987, 30, 148; *Chem. Abstr.* 1988, 108, 3418 b); palmitic (43.61), linoleic (26.24), behenic (14.39), myristic (13.44) and arachidic (2.32%) acids, β -sitosterol, α -tocopherol, glucose, xylose and rhamnose identified in seeds; protein content of defatted seed was 9.3% and alanine, valine, isoleucine, leucine, arginine, glycine and aspartic acid were present in protein (*Proc. Natl. Acad. Sci. India* 1988, 58A, 339; *Chem. Abstr.* 1989, 110, 189389 n).

B. malabaricum DC.; see *B. ceiba* L.

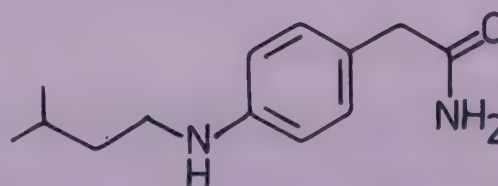
BONGARDIA (Berberidaceae)

B. chrysogonum (L.) Spach syn. *B. rauwolfii* C.A. Mey. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 61).

A new phenolic fatty ester - bongardol - and an alkaloid - jordanine - isolated from Jordanian plant (*J. Nat. Prod.* 1989, 52, 818).

NEW COMPOUNDS

Bongardol



Jordanine

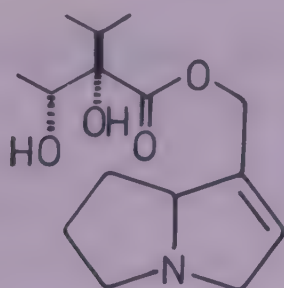
B. rauwolfii C.A. Mey.; see *B. chrysogonum* (L.) Spach

BORAGO (Boraginaceae)

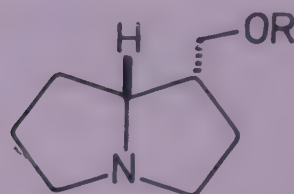
B. officinalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 101).

Amabiline isolated from seeds and leaves whereas thesinine from flowers and seeds and their structures elucidated (*J. Nat. Prod.* 1986, 49, 727); γ -linolenic (21.0), linoleic (38.9), oleic (18.6) and palmitic (12.0%) acids estimated in seed oil (33.0%) (*J. Pharm. Belg.* 1988, 43, 359; *Chem. Abstr.* 1989, 111, 54206 a).

NEW COMPOUNDS



Amabiline



Thesinine

R = p-Coumaroyl

BORASSUS (Arecaceae)

B. flabellifer L. syn. *B. flabelliformis* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 101).

Aqueous infusion of roots produced initial stimulation followed by depression of spontaneous motor activity in mice; its LD₅₀ value >2.0 g/kg, i.p. Ethanolic extract inhibited granulation tissue formation in cotton pellet implanted rats. It also produced hypoglycaemic and hypocholesterolaemic effects in rats; LD₅₀ 1.68 g/kg, i.p. (*J. Res. Ayurveda & Siddha* 1989, 10, 75).

B. flabelliformis Roxb.; see *B. flabellifer* L.

BORRERIA (Rubiaceae)

B. pusilla (Wall.) DC. syn. *Spermacoce stricta* L.f., *Borreria stricta* (L.f.) K. Schum. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 101).

Isolation of β -sitosterol, ursolic acid, rutin and quercetin from seeds (*Fitoterapia* 1987, 58, 135).

B. stricta (L.f.) K. Schum.; see *B. pusilla* (Wall.) DC.

BOSWELLIA (Burseraceae)

B. serrata Roxb. ex Coleb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 101).

Oil from oleoresin of Indian plant contained high content of α -thujene (*Flavour Fragrance J.* 1987, 2, 99; *Chem. Abstr.* 1988, 109, 20291 t).

BIOLOGICAL ACTIVITY

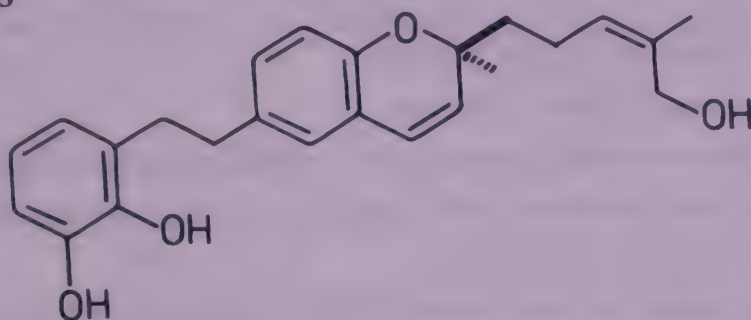
Salai guggal resin reduced cholesterol biosynthesis in rat liver at 100.0 mg/kg but not at 25.0 or 50.0 mg/kg (*Indian J. Pharmacol.* 1986, 18, 182).

BOTRYCHIUM (Botrychiaceae)

B. ternatum (Thunb.) Sw. syn. *Sceptridium ternatum* (Thunb.) Lyon. var. *ternatum*

New bibenyl derivative - ternatin - isolated from fronds along with quercetin-3-O- α -L-rhamnosyl-7-O- β -D-glucoside; structure of ternatin elaborated (*Chem. Pharm. Bull.* 1986, 34, 3727).

Distribution : Himalayas, from Garhwal to Arunachal Pradesh.

NEW COMPOUNDS

Ternatin

BOUGAINVILLEA (Nyctaginaceae)

B. spectabilis Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 102).

Quercetin-xyloside and isorhamnetin-glucorhamnoside isolated from flowers with ivory-white bracts (*Arogya* 1983, 9, 176); pinitol isolated from leaves (*Curr. Sci.* 1987, 56, 139).

BIOLOGICAL ACTIVITY

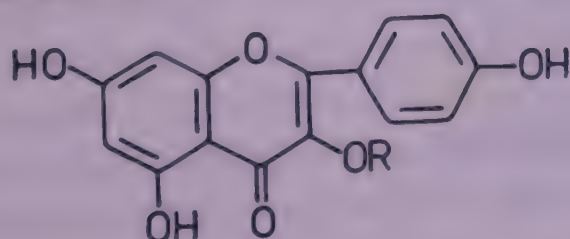
Pinitol (0.01 g/kg, p.o.) produced significant hypoglycaemia in normal fasted mice, maximum being at the end of 2 hr. Alloxan-induced diabetic mice on treatment with pinitol for 72 hr (5 doses), showed significant and persistent fall in blood sugar level. In glucose tolerance test, hypoglycaemic effect was observed (*Curr. Sci.* 1987, 56, 139).

BRAINEA (Blechnaceae)

B. insignis (Hook.) J. Sm.

A new flavonol acylglycoside - brainoside - isolated (*Yakugaku Zasshi* 1986, 106, 982; *Chem. Abstr.* 1987, 106, 116491 x).

Distribution : Meghalaya.

NEW COMPOUNDS

Brainoside

R = Gal(2 \rightarrow 1)Glu(6'''-caffeoyl)

BRASSICA (Brassicaceae)

B. alba (L.) Rabenh.; see *Sinapsis alba* L.

B. campestris L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 102).

α -Farnesene identified as major component (*Phytochemistry* 1988, 27, 2073).

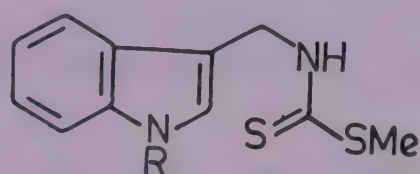
B. campestris L. ssp. *napus* (L.) Hook.f. & Thoms.; see *B. napus* L.

B. campestris L. ssp. *pekinensis* (Lour.) Olsson

Eng. - Celery cabbage, Chinese cabbage.

Three new sulphur-containing phytoalexins - methoxybrassinin, brassinin and cyclobrassinin - isolated from plant inoculated with *Pseudomonas chichorii* and characterised (*Chem. Commun.* 1986, 1077).

Distribution : Native of eastern Asia, introduced into India in hilly regions of north India and Tamil Nadu.

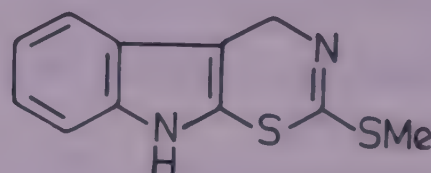
NEW COMPOUNDS

Brassinin

R = H

Methoxybrassinin

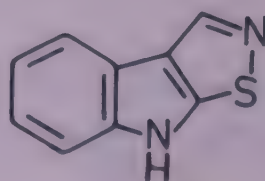
R = OMe



Cyclobrassinin

B. juncea (L.) Czern. & Coss. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 102).

Trans- β -ocimene identified as major component along with allylisothiocyanate (*Phytochemistry* 1988, 27, 2073); brassilexin isolated from leaves and its structure elucidated (*Tetrahedron Lett.* 1988, 29, 6447).

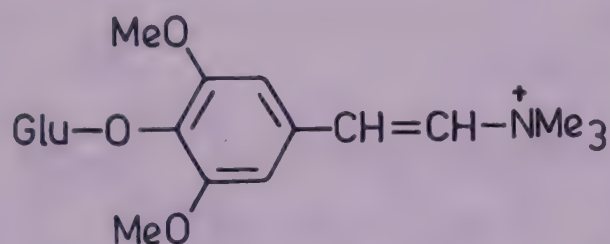
NEW COMPOUNDS

Brassilexin

B. napus L. syn. *B. campestris* L. ssp. *napus* (L.) Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 103).

Kaempferol-3-(O-sinapoylsophorosyl)-7-O-glucoside and kaempferol-3-(O-sinapoyl-glucosyl)-7-O-sophoroside isolated from seeds (*Bull. Liaison Groupe Polyphenols* 1986, 13, 68; *Chem. Abstr.* 1988, 108, 34772 s); synthesis of brassinolide (*Agric. Biol. Chem.* 1987, 51, 1909); a new quaternary base isolated from seeds and characterised as 2,6-dimethoxy-4-(2'-trimethylammonium ethenyl)phenyl- α -glucopyranoside (I) (*J. Nat. Prod.* 1988, 51, 585); α -farnesene identified as major component (*Phytochemistry* 1988, 27, 2073).

NEW COMPOUNDS



I

B. nigra (L.) Koch. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 104).

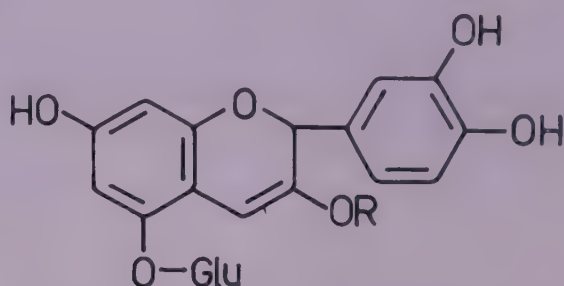
Verbenone as major component and allylisothiocyanate found in essential oil (*Phytochemistry* 1988, 27, 2073).

B. oleracea L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 108).

Two new acylated anthocyanins - 3-O-[2-O-(2'''-O-sinapoyl- β -D-glucopyranosyl)-6''-O-sinapoyl- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl) cyanidin (I) and 3-O-[2-O-(β -D-glucopyranosyl)-6''-O-p-coumaroyl- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl) cyanidin (II) isolated and characterised (Jpn. 85,477 (1986) May 01; *Chem. Abstr.* 1987, 106, 173191 y; Jpn. 62,209,173 (1987) Sep. 14; *Chem. Abstr.* 1988, 108, 35008 j; *Chem. Express* 1987, 2, 563; *Chem. Abstr.* 1988, 108, 3432 b); 3-O-[2-O-(β -D-glucopyranosyl)- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl)cyanidin (III) isolated (Jpn. 85,477 (1986) May 01; *Chem. Abstr.* 1987, 106, 173191 y); 3-O-[2-O(2'''-O-sinapoyl- β -D-glucopyranosyl)- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl)cyanidin (IV) isolated and characterised (*Chem. Express* 1987, 2, 563; *Chem. Abstr.* 1988, 108, 3432 b); 3-O-[2-O-(2'''-O-p-coumaroyl- β -D-glucopyranosyl)-6''-O-p-coumaroyl- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl)cyanidin (V), 3-O-[2-O-(2'''-O-feruloyl- β -D-glucopyranosyl)-6''-O-feruloyl- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl) cyanidin (VI), 3-O-[2-O-(2'''-O-caffeoyl- β -D-glucopyranosyl)-6''-O-caffeoyl- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl)cyanidin (VII), 3-O-[2-O-(β -D-glucopyranosyl)-6''-O-sinapoyl- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl)cyanidin (VIII), 3-O-[2-

O-(β -D-glucopyranosyl-6'''-O-feruloyl- β -D-glucopyranosyl)-6''-O-caffeoyl- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl)cyanidin (IX) and 3-O-[2-O-(2'''-O-caffeoyl- β -D-glucopyranosyl)- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl)cyanidin (X) isolated and characterised (Jpn. 62,209,173 (1987) Sep. 14; *Chem. Abstr.* 1988, 108, 35008 j; *Chem. Lett.* 1987, 145; *Chem. Abstr.* 1987, 106, 135274 v); two diacylated anthocyanins isolated and their structures elucidated as 3-O-[6''-O-p-coumaroyl-2-O-(2'''-O-sinapoyl- β -D-glucopyranosyl)- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl)cyanidin (XI) and 3-O-[6''-O-feruloyl-2-O-(2'''-O-sinapoyl- β -D-glucopyranosyl)- β -D-glucopyranosyl]-5-O-(β -D-glucopyranosyl) cyanidin (XII) (*Chem. Express* 1987, 2, 555; *Chem. Abstr.* 1987, 107, 233170 y).

NEW COMPOUNDS



I

R = Glu[6''-sinapoyl](2→1)Glu(2'''-sinapoyl)

II

R = Glu(6''-p-coumaroyl)(2→1)Glu

III

R = Glu(2→1)Glu

IV

R = Glu(2→1)Glu(2'''-sinapoyl)

V

R = Glu[6''-p-coumaroyl](2→1)Glu(2'''-p-coumaroyl)

VI

R = Glu[6''-feruloyl](2→1)Glu(2'''-feruloyl)

VII

R = Glu[6''-caffeoyl](2→1)Glu(2'''-caffeoyl)

VIII

R = Glu[6''-sinapoyl](2→1)Glu

IX

R = Glu[6''-caffeoyl](2→1)Glu-Glu(6'''-feruloyl)

X

R = Glu(2→1)Glu(2'''-caffeoyl)

XI

R = Glu[6''-p-coumaroyl](2→1)Glu(2'''-sinapoyl)

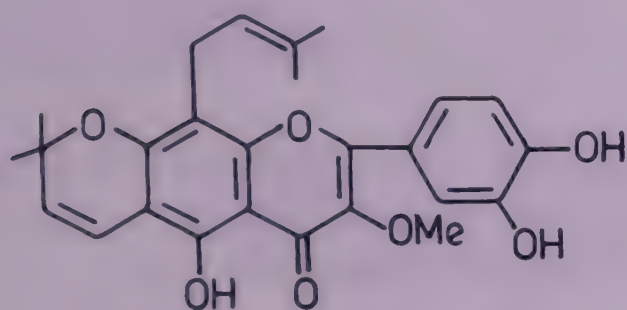
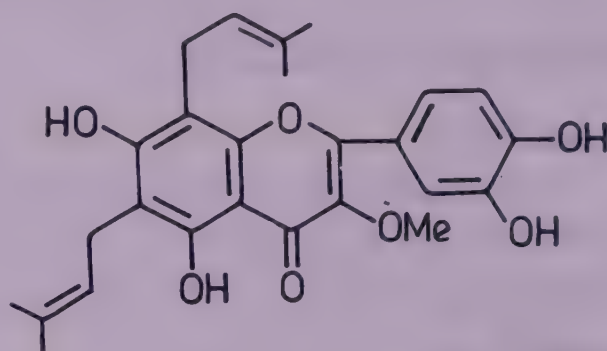
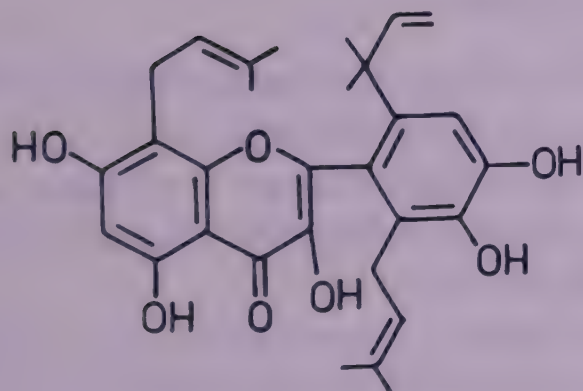
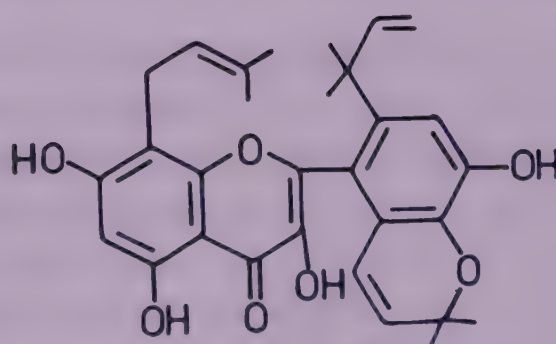
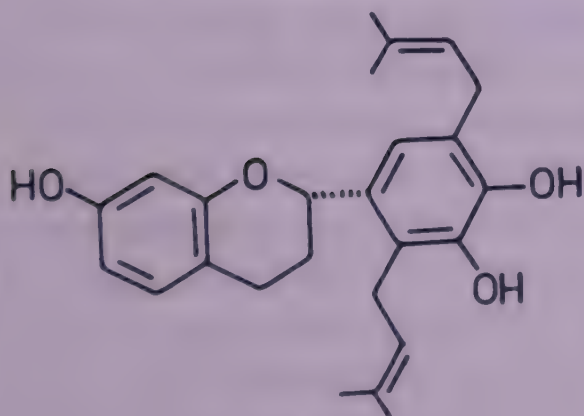
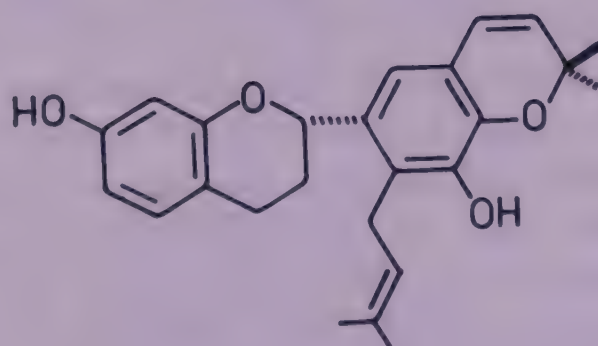
XII

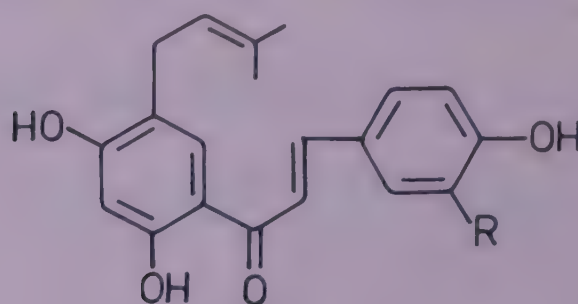
R = Glu[6''-feruloyl](2→1)Glu(2'''-sinapoyl)

BROUSSONETIA (Moraceae)

B. papyrifera (L.) Vent. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 105).

Two new isoprenylated flavonols - broussoflavonols A and B - and two isoprenylated chalcones - broussochalcones A and B - isolated from cortex and characterised (*Chem. Pharm. Bull.* 1985, 33, 3250); two isoprenylated flavans - kazinols A and B - isolated from cortex and their structures elucidated (*Heterocycles* 1985, 23, 2835); isolation of broussoflavonols C and D from root bark and their structures determination (*Chem. Pharm. Bull.* 1986, 34, 1987).

NEW COMPOUNDS**Broussoflavonol A****Broussoflavonol B****Broussoflavonol C****Broussoflavonol D****Kazinol A****Kazinol B**



Brousochalcone A

R = OH

Brousochalcone B

R = H

BROWNEA (Caesalpinaceae)*B. ariza* Benth.

β -Sitosterol, apigenin, kaempferol, quercetin and cyanidin-3-glucoside isolated from flowers (*Indian J. Nat. Prod.* 1988, 4(2), 9; *Chem. Abstr.* 1989, 110, 228631 g).

Distribution : Native to tropical America, introduced into Indian gardens.

BRUCEA (Simaroubaceae)

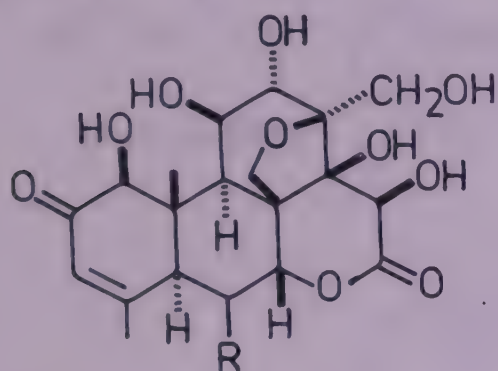
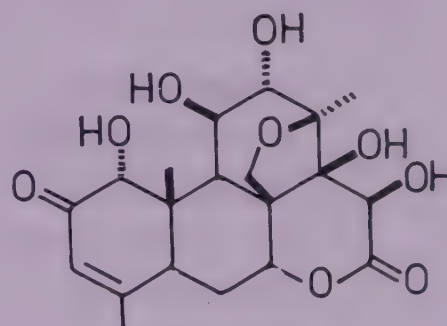
B. amarissima (Lour.) Merr.; see *B. javanica* (L.) Merr.

B. javanica (L.) Merr. syn. *B. amarissima* (Lour.) Merr., *B. sumatrana* Roxb. (*Compend. Indian Med. Plants*, Vol: 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 105).

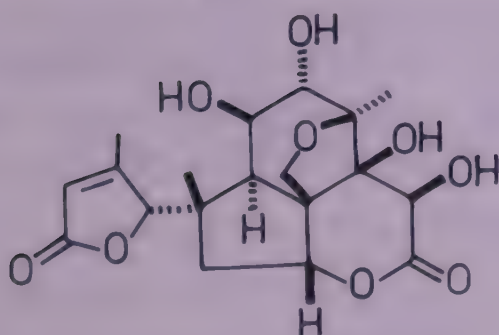
Emulsions of seed oil-oleic acid markedly disrupted ultrastructures of Ehrlich ascites carcinoma cells of mice; at high concentrations whole cells completely collapsed (*Shenyang Yaoxueyuan Xuebao* 1986, 3, 1; *Chem. Abstr.* 1986, 104, 179865 b).

Three new quassinoides - yadanziolides A, B and C - isolated from seeds and their structures elucidated (*Chem. Pharm. Bull.* 1984, 32, 4698; *Bull. Chem. Soc. Jpn.* 1985, 58, 2673; *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 513; *Chem. Abstr.* 1986, 104, 165312 g); another quassinoid - yadanziolide D - from seeds and its structure elucidation (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 513; *Chem. Abstr.* 1986, 104, 165312 g; *Chem. Pharm. Bull.* 1988, 36, 841); eight new antileukaemic glycosides - yadanziosides A, B, C, D, E, F, G, H - isolated from seeds and their structures elucidated (*Chem. Pharm. Bull.* 1984, 32, 4702; *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 513; *Chem. Abstr.* 1986, 104, 165312; *Bull. Chem. Soc. Jpn.* 1985, 58, 2680); yadanziosides F, I, J and L from seeds and their characterisation (*Bull. Chem. Soc. Jpn.* 1985, 58, 2673; *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 513; *Chem. Abstr.* 1986, 104, 165312 g); yadanziosides K, M, N and O also isolated from seeds and their structures determined (*Tennen Yuki Kagobutsu Toronkai Koen*

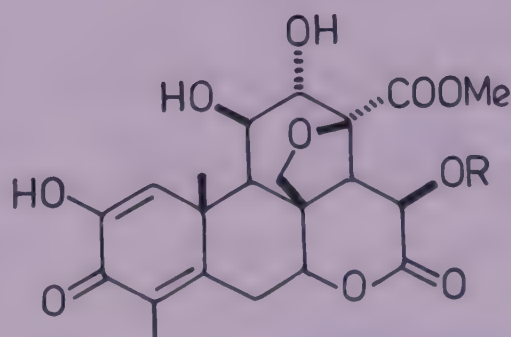
NEW COMPOUNDS


$$R = H$$
$$R = \alpha\text{-OH}$$


Yadanziolide C



Yadanzolide D

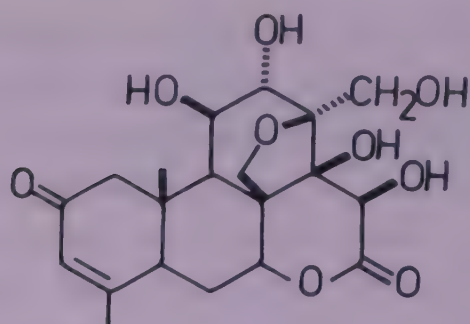


Dehydrobrusatol

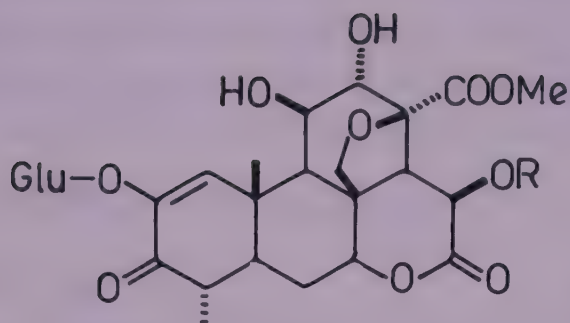


Dehydrobruceantinol





Bruceine H



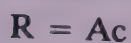
Yadanzioside A



Yadanzioside C



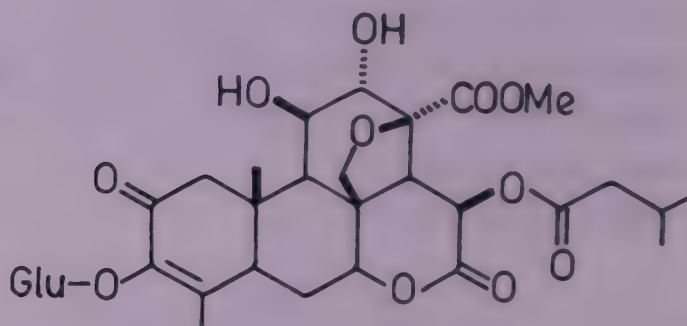
Yadanzioside F



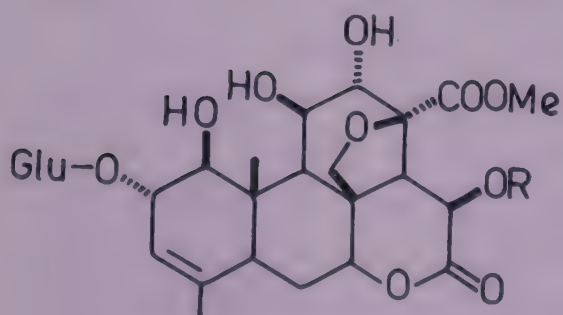
Yadanzioside G



Yadanzioside J



Yadanzioside B



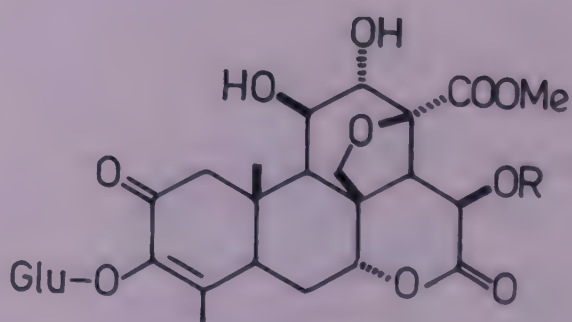
Yadanzioside D



Yadanzioside E



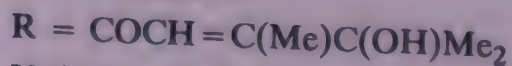
Yadanzioside H



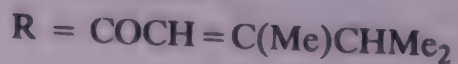
Yadanzioside I

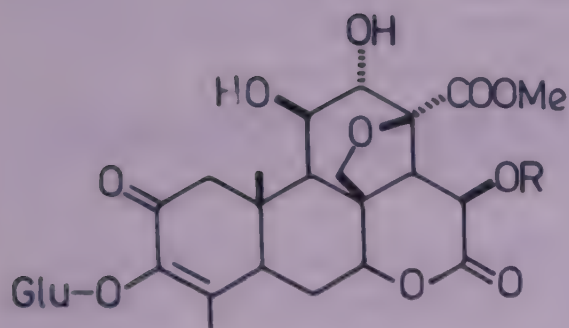


Yadanzioside L

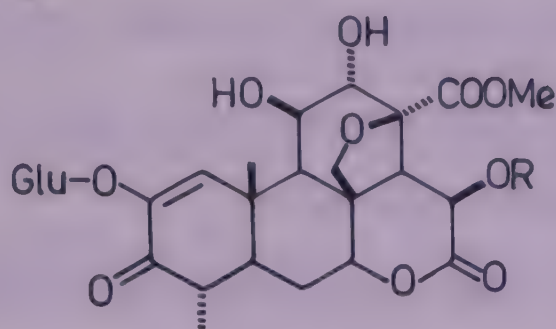


Yadanzioside P





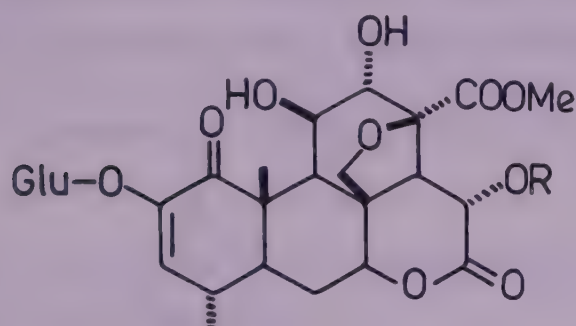
Yadanzioside K

$$R = \text{COCH}=\text{C}(\text{Me})\text{C}(\text{OAc})\text{Me}_2$$


Yadazioside M

$$R = \text{Benzoyl}$$

Yadanzioside O

$$R = \text{COCH}=\text{C}(\text{Et})\text{C}(\text{OAc})\text{Me}_2$$


Yadanzioside N

$$R = \text{COCH}=\text{C}(\text{Me})\text{CHMe}_2$$

BIOLOGICAL ACTIVITY

Yadanziosides A, B, C, D, E, F, G, H, I, J, K and L exhibited antileukaemic activity against P-388 lymphocytic leukaemia (*Bull. Chem. Soc. Jpn.* 1985, 58, 2673, 2680; *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 513; *Chem. Abstr.* 1986, 104, 165312 g); aglycone of yadanzioside O showed significant antitumor activity against P-388 lymphocytic leukaemia (*Bull. Chem. Soc. Jpn.* 1986, 59, 3541; *Tetrahedron Lett.* 1986, 27, 593); bruceantin at concentration of 0.008 $\mu\text{g}/\text{ml}$ inhibited incorporation of [3H] hypoxanthine by 50.0% into *Plasmodium falciparum* in vitro (*Antimicrob. Agents Chemother.* 1986, 30, 101; *Chem. Abstr.* 1986, 105, 107945 a); antitumor activity of brusatol (*Zhongcaoyao* 1988, 19, 294; *Chem. Abstr.* 1988, 109, 204508 a).

B. sumatrana Roxb.; see *B. javanica* (L.) Merr.

BRUNELLA (Lamiaceae)

B. vulgaris L.; see *Prunella vulgaris* L.

BRUNFELSIA (Solanaceae)

B. nitida Benth.

Scopoletin and oleanolic acid isolated from plant grown in Cuba (*Pharmazie* 1986, 41, 746; *Chem. Abstr.* 1987, 106, 72769 n).

Distribution : Native to tropical America and West Indies, introduced into Indian gardens.

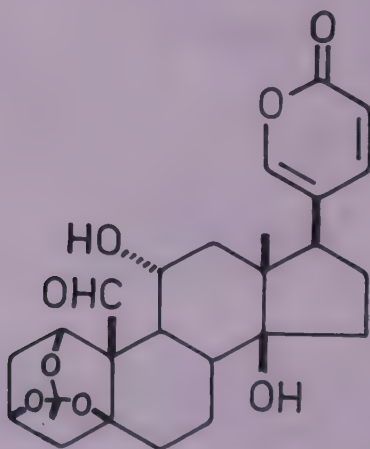
BRYOPHYLLUM (Crassulaceae)

B. calycinum Salisb.; see *B. pinnatum* (Lam.) Oken

B. pinnatum (Lam.) Oken syn. *Kalanchoe pinnata* Pers., *Bryophyllum calycinum* Salisb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 112).

A flavone glycoside - quercetin-3-O- α -L-arabinopyranosyl(1 \rightarrow 2)- α -L-rhamnopyranoside - isolated (Jpn. 61,118,396 (1986) June 05; *Chem. Abstr.* 1986, 105, 178423 q); a new cytotoxic bufadienolide-1,3,5-orthoacetate - bryophyllin A - isolated together with bersaldegenin-3-acetate and its structure established (*Chem. Pharm. Bull.* 1988, 36, 1615).

NEW COMPOUNDS



Bryophyllin A

BIOLOGICAL ACTIVITY

Quercetin-3-O- α -L-arabinopyranosyl(1 \rightarrow 2)- α -L-rhamnopyranoside showed anti-allergic activity in rats (Jpn. 61,118,319 (1986) June 05; *Chem. Abstr.* 1986, 105, 158797 m).

BUCHANANIA (Anacardiaceae)

B. lanzan Spreng. syn. *B. latifolia* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 42).

Isolation of kaempferol and its 7-O-glucoside, gallic acid, quercetin, its 3-O-rhamnoglucoside and 7-O-rhamnoside from leaves (*J. Indian Chem. Soc.* 1988, 65, 882).

B. latifolia Roxb.; see *B. lanzan* Spreng.

BUDDLEJA (BUDDLEIA) (Buddlejaceae) ?

B. asiatica Lour.; see *B. neemda* Ham. ex Roxb.

B. globosa Hope (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 108).

Aqueous extract, used as traditional medicine for treatment of liver ailments, showed inhibition of induced cytotoxicity of cultured hepatocytes; glycyrrhizin used as reference compound.

Two new iridoids - 7-p-methoxycinnamoylaucubin and 7-p-methoxycinnamoylcatalposide - along with catalposide, catalpol and aucubin, two phenylpropides - acteoside and echinacoside - and a flavonoid glycoside - linarin - isolated from leaves (*Planta Med.* 1989, 55, 123).

BIOLOGICAL ACTIVITY

Acteoside, echinacoside, 7-p-methoxycinnamoylaucubin, 7-p-methoxy cinnamoylcatalposide and linarin inhibited induced cytotoxicity of cultured hepatocytes (*Planta Med.* 1989, 55, 123).

B. neemda Ham. ex Roxb. syn. *B. asiatica* Lour. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 108).

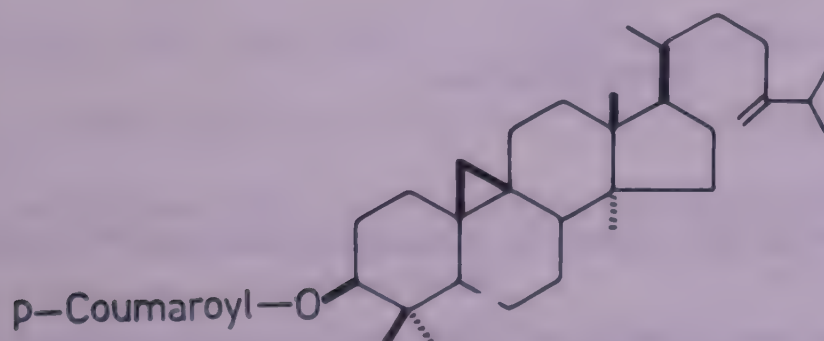
Combretol, β -sitosterol and hentriacontanone isolated from seeds (*Indian Drugs* 1985, 22, 116).

BULBOPHYLLUM (Orchidaceae)

B. elatum (Hook.f.) J.J. Smith syn. *Cirrhopetalum elatum* Hook.f.

Isolation and characterisation of a new triterpene - pholidotin (24-methylenecycloartanyl p-coumarate) (*Phytochemistry* 1985, 24, 2120; *Indian J. Chem.* 1987, 26B, 297).

Distribution : Himalayas, Nepal eastwards, alt. 1200-1500 m.

NEW COMPOUNDS

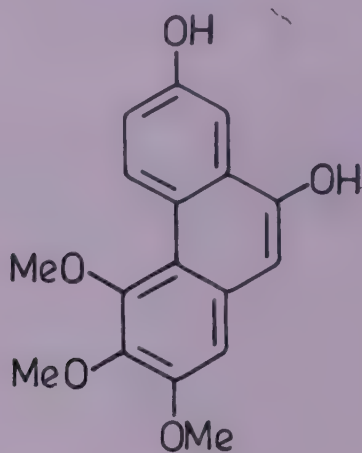
Pholidotin

B. gymnopus Hook.f.

Gymnopusin isolated and characterised as 7,9-dihydroxy-2,3,4-trimethoxyphenanthrene (*Phytochemistry* 1988, 27, 245).

Distribution : Eastern Himalayas and north-east India, alt. 1200-1600 m.

NEW COMPOUNDS



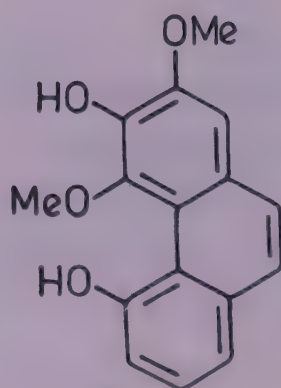
Gymnopusin

B. leopardium (Wall.) Lindl.

A new phenanthrene derivative - bulbophyllanthrin - isolated and its structure elucidated (*Phytochemistry* 1985, 24, 2083).

Distribution : Nepal and Khasia Hills in Meghalaya, alt. 900-1500 m.

NEW COMPOUNDS



Bulbophyllanthrin

BUPLEURUM (Apiaceae)

B. falcatum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 109).

An anti-complementary pectic polysaccharide (BR-2-IIb) isolated from roots, consisted of galacturonic acid, arabinose, rhamnose and galactose in molar ratio of 13.0:2.1:1.4:1.0 (*Carbohydr. Res.* 1989, 189, 209; *Chem. Abstr.* 1989, 111, 97655 p).

BIOLOGICAL ACTIVITY

Prostaglandin E2 biosynthesis by rat peritoneal macrophages stimulated by saikosaponins b1, b2 and d while saikosaponins a and c inhibited it. Saikosaponin a also stimulated 3H-labelled arachidonic acid release from pre-labelled macrophages and caused generation of a SRS-like substance (*Planta Med.* 1985, 51, 208); saikogenin A less effective in adrenalectomized rats than in normal rats in reducing carrageenin-induced oedema. Serum corticosterone and ACT4 increased in saikogenin A-treated rats, supporting the view that stimulation of hypothalamopituitary-adrenal system was responsible for anti-inflammatory effect of saikogenin A (*Biochem. Pharmacol.* 1986, 35, 2483; *Chem. Abstr.* 1986, 105, 145847 c); saikosaponin d protected against carbon tetrachloride hepatotoxicity enhanced by phenobarbitone. It also inhibited increase in content of cytochrome P-450 and NADPH cytochrome reductase activity induced by phenobarbitone treatment (*J. Pharm. Pharmacol.* 1985, 37, 555).

B. falcatum L. var. *marginata* (Wall. ex DC.) Clarke; see *B. falcatum* L. var. *scorzoneraefolium* (Willd.) Ledeb.

B. falcatum L. var. *scorzoneraefolium* (Willd.) Ledeb. syn. *B. falcatum* L. var. *marginata* (Wall. ex DC.) Clarke, *B. linearifolium* DC., *B. scorzoneraefolium* Willd., *B. marginata* Wall. ex DC. (*marginatum*) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 110).

Saikogenin F-3-O- β -D-fucopyranoside isolated (*Chem. Pharm. Bull.* 1986, 34, 1158); roots contained saikosaponin (0.4%), arabinose, glucose, sucrose, oleic acid and linoleic acid (*Zhiwu Shenglixue Tongxun* 1987, 33; *Chem. Abstr.* 1988, 109, 3851 h).

B. hamiltonii Balak. syn. *B. tenue* Buch.-Ham. ex D. Don (non Salisb.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 111).

Rutin, narcissin, kaempferol and quercetin isolated (*Zhiwu Xuebao* 1985, 27, 75; *Chem. Abstr.* 1985, 102, 182436 b).

B. linearifolium DC.; see *B. falcatum* L. var. *scorzoneraefolium* (Willd.) Ledeb.

B. marginata Wall. ex DC.; see *B. falcatum* L. var. *scorzoneraefolium* (Willd.) Ledeb.

B. scorzoneraefolium Willd.; see *B. falcatum* L. var. *scorzoneraefolium* (Willd.) Ledeb.

B. tenue Salisb.; see *B. hamiltonii* Balak.

BUTEA (Papilionaceae)

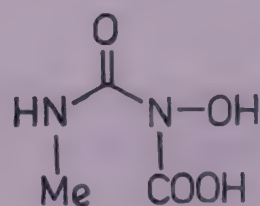
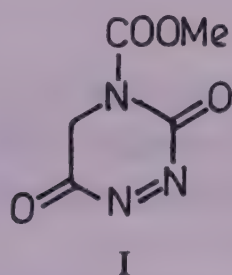
B. frondosa Koen. ex Roxb.; see *B. monosperma* (Lam.) Taub.

B. monosperma (Lam.) Taub. syn. *B. frondosa* Koen. ex Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 112).

Flower extract exhibited antihepatotoxic activity (*Planta Med.* 1986, 57, 77); seeds given orally effective in roundworm and threadworm infestations but ineffective in case of tapeworm. Nausea, vomiting, dizziness, general weakness and pain in abdomen regularly observed as side-effects (*J. Res. Ayurveda & Siddha* 1986, 7, 13); extracts of seed and seed coat (0.12 g/kg, p.o.) administered daily from day one post-coitum for ten days prevented pregnancy in female rats (*Natl. Acad. Sci. Lett.* 1988, 11, 81).

Isolation of butrin and isobutrin from flowers (*Planta Med.* 1986, 52, 77); a new compound - 4-carbomethoxy-3,6-dioxo-5-hydro-1,2,4-triazine (I) - isolated (*Natl. Acad. Sci. Lett.* 1988, 11, 81); a new derivative of allophanic acid isolated from outer seed coat and characterised as 2-hydroxy- ω -methylallophanic acid (*Indian J. Chem.* 1988, 27B, 281); synthesis of (+)leucocyanidin (*J. Nat. Prod.* 1988, 51, 730).

NEW COMPOUNDS



2-Hydroxy- ω -methylallophanic acid

CACCINA (Boraginaceae)

C. crassifolia O. Kuntze syn. *C. glauca* Savi (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 116).

Aerial parts contained alkaloids (1.1%) in which echinatin and retronecine trachelanthate identified (*Khim. Prir. Soedin.* 1987, 463; *Chem. Abstr.* 1987, 107, 151274 w).

C. glauca Savi; see *C. crassifolia* O. Kuntze

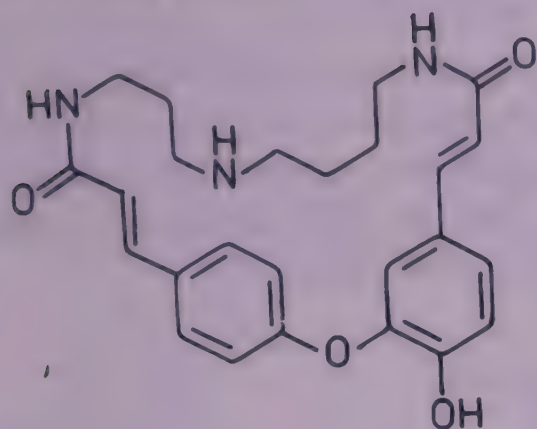
CADABA (Capparaceae)

C. farinosa Forsk.; see *C. fruticosa* (L.) Druce

C. fruticosa (L.) Druce syn. *C. farinosa* Forsk., *C. indica* Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 112).

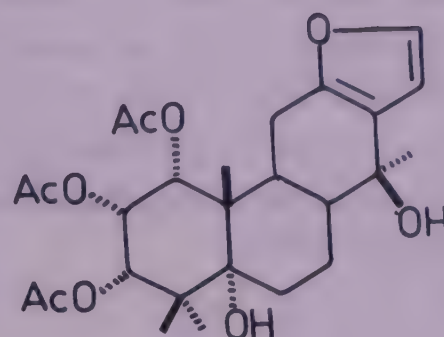
(-)-Stachydrine and 3-hydroxystachydrine (0.04%) isolated from stem (*Fitoterapia* 1984, 55, 117); new spermidine alkaloid - cadabicine - isolated along with its diacetate and its crystal structure elucidated (*Phytochemistry* 1985, 24, 2709; *J. Nat. Prod.* 1987, 50, 1186); a furanoditerpene - caesalpin F - isolated from seeds and characterised (*J. Nat. Prod.* 1986, 49, 913).

NEW COMPOUNDS



Cadabicine

C. indica Lamk.; see *C. fruticosa* (L.) Druce



Caesalpin F

CAESALPINIA (Caesalpinaceae)

C. bonduc (L.) Roxb. emend. Dandy & Exell. syn. *C. bonducella* (L.) Fleming, *C. crista* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 113).

(+)Ononitol isolated and characterised by X-ray analysis as 4-O-methylmyoinositol hydrate (*Jiegou Huaxue* 1988, 7, 103; *Chem. Abstr.* 1989, 110, 91998 k).

C. bonducella (L.) Fleming; see *C. bonduc* (L.) Roxb. emend. Dandy & Exell.

C. crista L.; see *C. bonduc* (L.) Roxb. emend. Dandy & Exell.

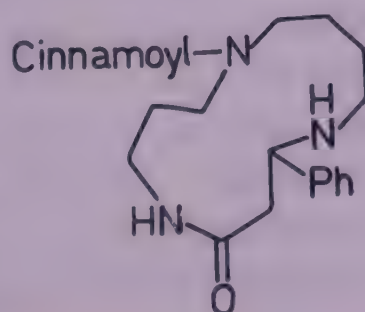
C. decapetala (Roth) Alston syn. *C. sepriaria* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 44).

Administration of plant extract (500 mg/kg, p.o.) on days 1-8 post-coitum, exhibited significant contraceptive activity in female hamsters, but was devoid of any estrogenic activity (*Indian J. Med. Res.* 1988, 87, 377).

C. digyna Rottl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 113).

Caesalpinine C isolated and its crystal structure determined by X-ray studies (*J. Chem. Soc. Perkin 2*, 1985, 193).

NEW COMPOUNDS

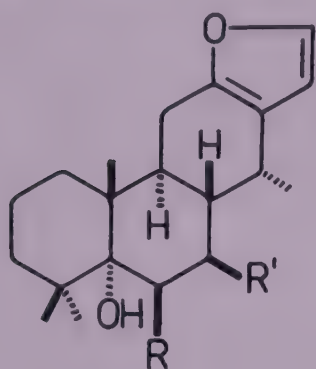


Caesalpinine C

C. pulcherrima (L.) Swartz syn. *Poinciana pulcherrima* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 114).

Three new diterpenoids - vouacapen-5 α -ol, its 6 β -cinnamoyloxy-7 β -hydroxy (I) and 8(14), 9(11)-didehydro (II) derivatives - isolated from roots and characterised; sitosterol also isolated (*Phytochemistry* 1986, 25, 167); new diterpene ester - pulcherralpin - isolated from stem and its structure elucidated (*J. Nat. Prod.* 1986, 49, 561); structure of 8-methoxybonducellin confirmed by synthesis (*Acta Chem. Scand.* 1987, 41B, 267).

NEW COMPOUNDS

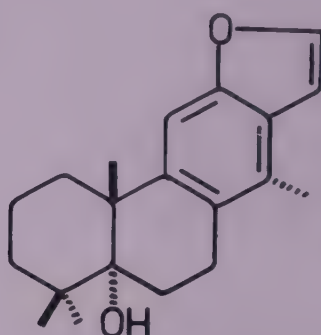


Vouacapen-5 α -ol

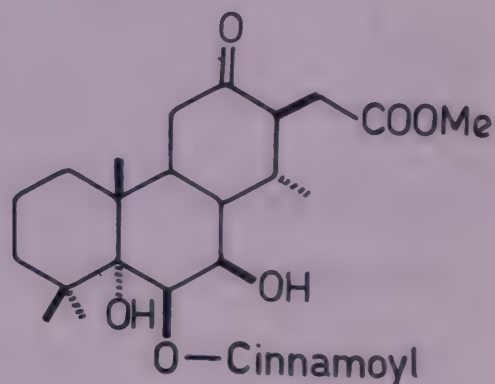
R, R' = H

I

R = O-Cinnamoyl, R' = OH



II



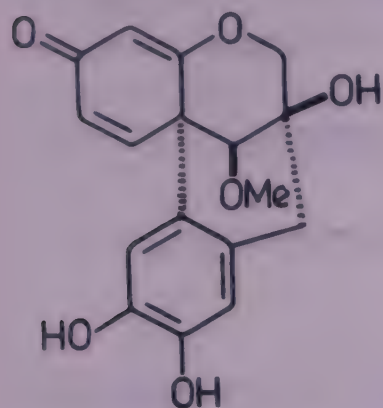
Pulcherralpin

C. sappan L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 117).

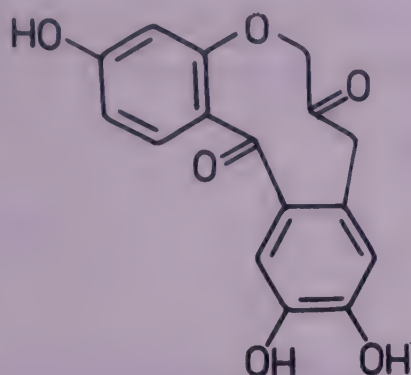
Caesalpin J and caesalpin P isolated from heartwood and their structures elucidated (*Chem. Pharm. Bull.* 1985, 33, 3545); crystal structure of caesalpin J determined (*Chem. Pharm. Bull.* 1986, 34, 4166); two new aromatic compounds (I and II) isolated from heartwood and characterised (*Phytochemistry* 1985, 24, 2403); protosappanin A isolated from heartwood and its structure determined and confirmed by X-ray analysis (*Chem. Pharm. Bull.* 1986, 34, 1); isolation and structure elucidation of protosappanin B from heartwood (*Heterocycles* 1986, 24, 601); a novel dibenzoxocin derivative (III) isolated from heartwood and its structure elucidated (*Chem. Pharm. Bull.* 1987, 35, 3615); octacosanol, β -sitosterol and taraxerol isolated from heartwood (*Acta Cienc. Indica, Chem.* 1987, 13, 87; *Chem. Abstr.* 1988, 109, 187282 c); three new homoisoflavonoids - 7-hydroxy-3-(4'-hydroxybenzylidene)chroman-4-one (IV), 3,7-dihydroxy-3-(4'-hydroxybenzyl)chroman-4-one (V) and 3,4,7-trihydroxy-3-(4'-hydroxybenzyl)chroman (VI) - isolated from heartwood along with 4,4'-dihydroxy-2'-methoxychalcone, 8-methoxybonducellin, quercetin, rhamnetin and ombuin (*Phytochemistry* 1987, 26, 1831); three new homoisoflavonoids - 3'-O-methylsappanol, 3'-O-methyl-episappanol and 3'-O-methylbrazilin - isolated from heartwood and absolute configurations of new compounds as well as sappanol, episappanol and 3'-deoxysappanol determined (*Chem.*

Pharm. Bull. 1987, 35, 2761); protosappanin C isolated from heartwood and characterised; its absolute configuration at C-7 determined as R (*Chem. Pharm. Bull.* 1987, 35, 3002).

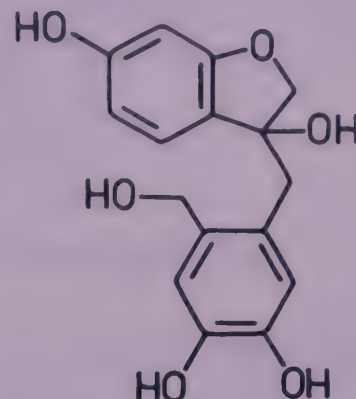
NEW COMPOUNDS



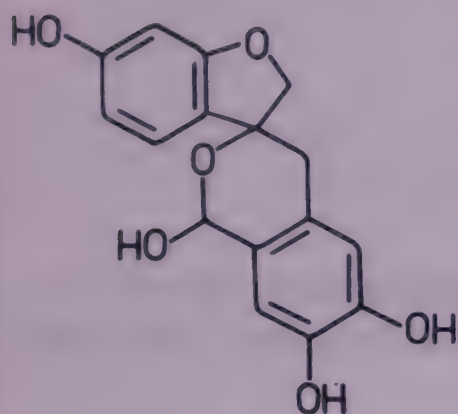
Caesalpin J



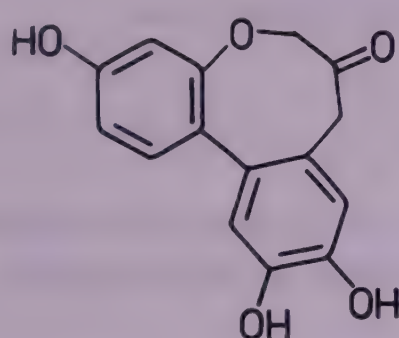
Caesalpin P



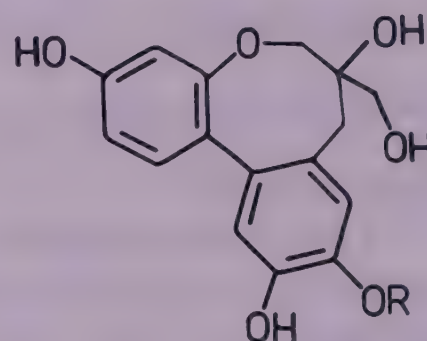
I



II



Protosappanin A

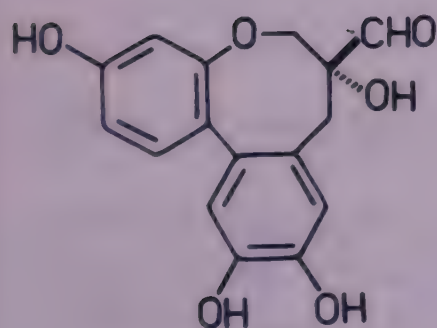


Protosappanin B

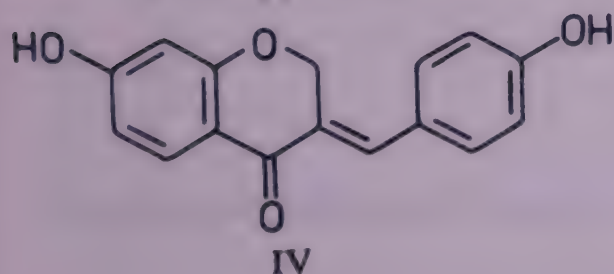
R = H

III

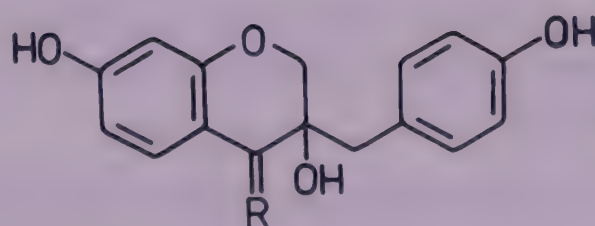
R = Me



Protosappanin C



IV

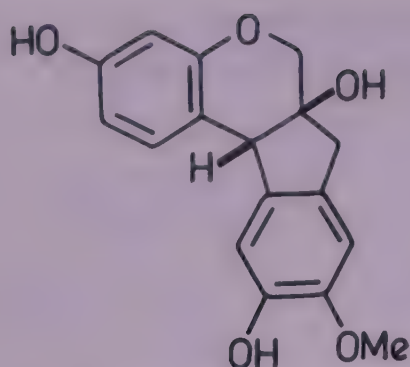


V

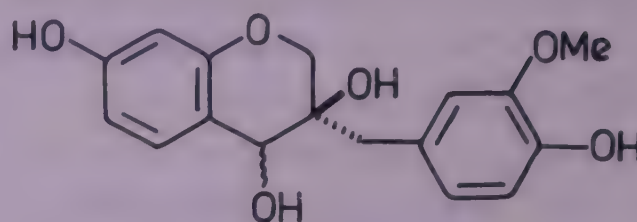
R = O

VI

R = OH, H



3'-O-Methylbrazilin



3'-O-Methylsappanol

~ = β

3'-O-Methylepisappanol

~ = α

BIOLOGICAL ACTIVITY

Compounds I and II possessed antihypercholesterolaemic activity (*Phytochemistry* 1985, 24, 2403); protosappanin A showed weak sedative effect at 42.0 mg/kg, i.p., in mice induced by hexobarbital (*Chem. Pharm. Bull.* 1986, 34, 1).

C. sepiaria Roxb.; see *C. decapetala* (Roth) Alston

CAESULIA (Asteraceae)

C. axillaris Roxb.

A new aromatic aldehyde - 2,4,5-trimethoxycinnamaldehyde - isolated along with γ -asaronone and 2,4,5-trimethoxybenzaldehyde and its structure determined (*Indian J. Chem.* 1986, 25B, 981).

Distribution : Almost throughout India in plains, ascending to 900 m in hills.

CAJANUS (Papilionaceae)

C. cajan (L.) Millsp. syn. *C. indicus* Spreng. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 114).

Vitexin, salicylic acid, hentriacontane, 2-carboxyl-3-hydroxy-4-isoprenyl-5-methoxystilbene, laccerial, longistylin A, longistylin C, pinostrobin, naringenin-7,4'-dimethyl ether, β -amyrin and β -sitosterol isolated from leaves (*Zhongcaoyao* 1985, 16, 2; *Chem. Abstr.* 1986, 104, 126490 u).

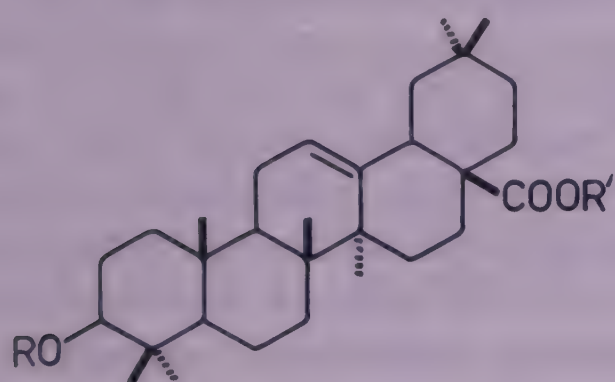
C. indicus Spreng.; see *C. cajan* (L.) Millsp.

CALENDULA (Asteraceae)

C. arvensis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 45).

Two new triterpenoid glycosides - arvenosides A and B - isolated and characterised (*Phytochemistry* 1987, 26, 1785); isolation of arvoside A from aerial parts and its structure elucidation (*J. Nat. Prod.* 1987, 50, 784); four triterpenoid saponins (I, II, III and IV) isolated from aerial parts and their structures elucidated (*J. Nat. Prod.* 1987, 50, 927); four new sesquiterpene glycosides - arvoside B and its three derivatives (V, VI and VII) - isolated from aerial parts and characterised (*Phytochemistry* 1988, 27, 2205).

NEW COMPOUNDS

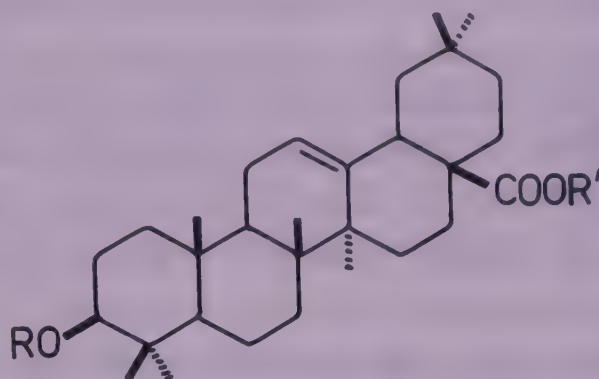


Arvenoside A

R = Glu(3→1)Gal, R' = Glu

Arvenoside B

R = Glu(3→1)Gal, R' = H



I

R = Glu(3→1)Gal, R' = Glu

II

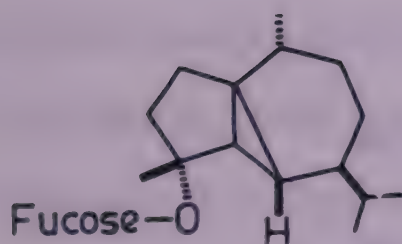
R = Glu(3→1)Gal, R' = H

III

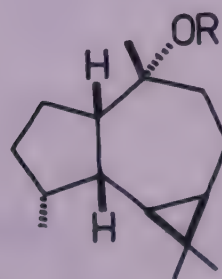
R = Gluc.acid(3→1)Gal, R' = Glu

IV

R = Gluc.acid(3→1)Gal, R' = H



Arvoside A



Arvoside B

R = Fuc

V

R = Fuc(2'-Ac)

VI

R = Fuc(2'-2-MeButyryl)

VII

R = Fuc[2'-(3-Me-2-pentenoyl)]

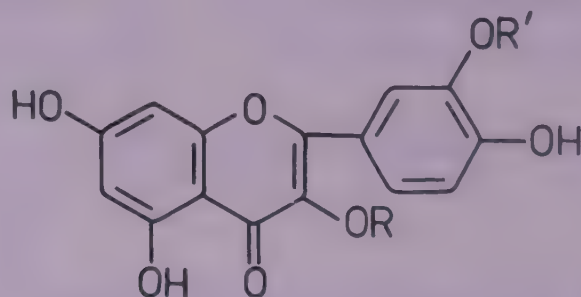
BIOLOGICAL ACTIVITY

Arvenoside A exhibited anti-inflammatory activity (*Phytochemistry* 1987, 26, 1785).

C. officinalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 115).

Olean-12-en-3 β ,16 β ,28-triol, lup-20(29)-en-3 β ,16 β ,28-triol, tarax-20-en-3 β ,16 β ,22 α -triol, tarax-20-en-3 β ,16 β ,30-triol and urs-12-en-3 β ,16 β ,21-triol isolated from flowers (*Phytochemistry* 1985, 24, 3066); (-)loliolide (calendin) isolated from flowers (*Planta Med.* 1987, 53, 304); water-soluble polysaccharides (14.75), pectic substances (9.67) and hemicellulose (5.92%) estimated in inflorescences (*Khim. Prir. Soedin.* 1988, 585; *Chem. Abstr.* 1988, 109, 226748 f); calendulose F identified in flowers (*Plant. Med. Phytother.* 1988, 22, 235; *Chem. Abstr.* 1989, 111, 180541 u); three new flavonoids - calendoflaside, calendoflavoside and calendoflavobioside - isolated from inflorescences along with narcissin, quercetin, isoquercitrin, isorhamnetin and its 3-O- β -D-glucoside; structures of new compounds determined (*Khim. Prir. Soedin.* 1988, 795; *Chem. Abstr.* 1989, 111, 4243 q); isorhamnetin-3-O-glucoside, -3-O-rutinoside, -3-O-neohesperidoside and -3-O-glucosyl[(2 \rightarrow 1)rhamnosyl]-(6 \rightarrow 1) rhamnoside, quercetin-3-O-glucoside, -3-O-neohesperidoside and -3-O-glucosyl[(2 \rightarrow 1)rhamnosyl]-(6 \rightarrow 1)rhamnoside isolated from flowers (*Planta Med.* 1989, 55, 73).

NEW COMPOUNDS



Calendoflaside

R = Rha(2 \rightarrow 1)Rha, R' = Me

Calendoflavoside

R = Glu(2 \rightarrow 1)Rha, R' = Me

Calendoflavobioside

R = Glu(2 \rightarrow 1)Rha, R' = H

CALLICARPA (Verbenaceae)

C. arborea Roxb. ex Clarke (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 121).

L(+) α -Amino- β -(p-methoxyphenyl)propionic acid identified in leaves (*Zhongcaoyao* 1985, 16, 556; *Chem. Abstr.* 1986, 104, 145509 y).

C. macrophylla Vahl (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 121).

L(+) α -Amino- β -(p-methoxyphenyl)propionic acid identified in leaves (*Zhongcaoyao* 1985, 16, 556; *Chem. Abstr.* 1986, 104, 145509 y).

CALLISTEMON (Myrtaceae)

C. lanceolatus DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 115).

Neutral lipid fraction (98.0%) from seed oil contained triglycerides (86.9), free fatty acids (2.8), diglycerides (2.4), hydrocarbons (2.3), monoglycerides (1.8) and wax esters (1.8%); linoleic (74.5), oleic (12.3), palmitic (9.3), stearic (1.6), caprylic (0.8), lauric (0.7), arachidic (0.3), linolenic (0.2), behenic (0.2) and myristic (0.1%) acids identified in oil (*Pakistan J. Sci. Ind. Res.* 1989, 32, 133; *Chem. Abstr.* 1989, 111, 54191 s).

C. rigidus R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 116).

1,8-Epoxy-p-menthane (39.1), limonene (18.5), α -pinene (15.2) and β -pinene (10.8%) determined in fruit oil (*Rev. Bras. Farm.* 1987, 68, 78; *Chem. Abstr.* 1988, 109, 196971 d).

CALLITRIS (Cupressaceae)

C. glauca R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 116).

Myricetin-7-arabinoside, quercetin and its arabinoside, quercitrin, kaempferol and its 5-rhamnoside, galangin and shikimic acid isolated from leaves (*Phytochemistry* 1987, 26, 1221).

CALONYCTION (Convolvulaceae)

C. aculeatum (L.) House; *Ipomoea alba* L.

C. muricatum (L.) G.Don; see *Ipomoea turbinata* Lag.

CALOPHYLLUM (Clusiaceae)

C. apetalum Willd. syn. *C. wightianum* Wall. ex Planch. & Triana (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 116).

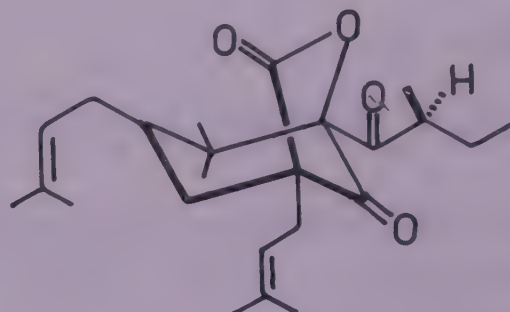
Isolation of a clathrate compound composed of four moles of wightianone and one mole of palmitic acid; wightianone shown to be identical to zeyloxanthone (*J. Chem. Soc. Perkin* 1, 1984, 1755).

C. soulattri Burm.f. syn. *C. spectabile* sensu Hook.f. p.p. (non Willd.)

Soulattrone A isolated from bark and its structure confirmed by X-ray studies (*Phytochemistry* 1988, 27, 527).

Distribution : Andaman and Nicobar Islands.

NEW COMPOUNDS



Soulattrone A

C. spectabile Willd.; see *C. soulattri* Burm.f.

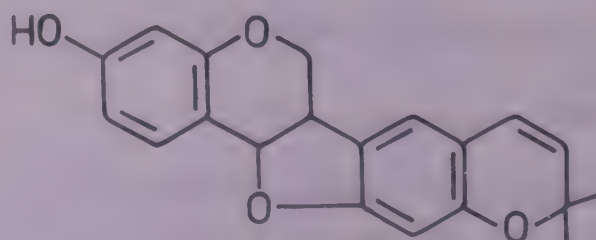
C. wightianum Wall. ex Planch. & Triana; see *C. apetalum* Willd.

CALOPOGONIUM (Papilionaceae)

C. mucunoides Desv. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 118).

A new phytoalexin - isoneurautenol - isolated from leaflets infected with *Helminthosporium carbonum* and characterised; demethylmedicarpin, neodunol, tuberosin, sophorapterocarpan A and calopocarpin also isolated (*Z. Naturforsch.* 1985, 40C, 482; *Chem. Abstr.* 1985, 103, 211102 t); linoleic, stearic and palmitic acids and 6-acetyl-5-hydroxy-2,2-dimethylchromene identified in seed oil; β -sitosterol, stigmasterol, pinitol and 8,4'-dihydroxyisoflavone isolated from stem whereas leaves afforded 7,8-dimethoxy-3',4'-methylene-dioxyisoflavone (*Quim. Nova* 1988, 11, 196; *Chem. Abstr.* 1989, 110, 21106 u).

NEW COMPOUNDS



Isonerautenol

CALOTROPIS (Asclepiadaceae)

C. gigantea (L.) R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 118)

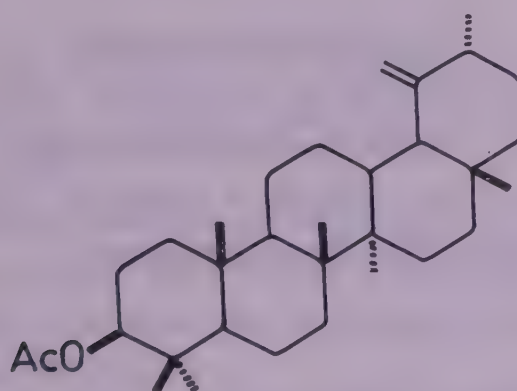
Two new triterpene esters - 3'-methylbutanoates of α -amyrin and ψ -taraxasterol - isolated from latex (*Phytochemistry* 1984, 23, 2085).

C. procera (Ait.) R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 118).

Powdered bark showed antidiarrhoeal effect in cases of 'Atisara' and 'Pravahika' at a dose of 250.0 mg thrice daily for seven and fifteen days respectively; it increased bile secretions and showed sedative action on muscles allaying all pain and irritation of intestine. It cured 67.1% patients of 'Atisara' and 44.7% of 'Pravahika' (*J. Res. Ayurveda & Siddha* 1985, 6, 88).

Quercetin-3-rutinoside identified in roots (1.66), stem (4.82), leaves (5.01), flowers (7.63) and latex (9.74%) (*J. Sci. Res.* 1985, 7, 141; *Chem. Abstr.* 1987, 107, 151184 s); new triterpene - calotropenyl acetate - isolated from flowers and its structure elucidated (*J. Nat. Prod.* 1988, 51, 925); lupeol isolated from latex (*Curr. Sci.* 1989, 58, 302); isolation of β -amyrin, α - and β -calotropeols and 3-epimoretenol from latex (*Curr. Sci.* 1989, 58, 740).

NEW COMPOUNDS



Calotropenyl acetate

CALPURNIA (Papilionaceae)

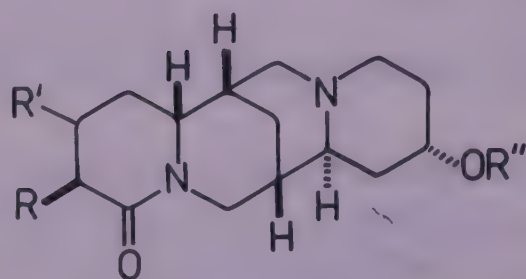
C. aurea (Ait.) Benth. ssp. *aurea* syn. *C. lasiogyne* E. Mey.

Eng. - East African laburnum, Golden tassels, Kenyan laburnum.

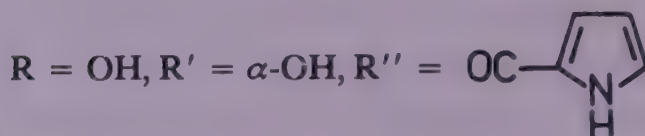
Two new alkaloids - 3 β ,4 α ,13 α -trihydroxylupanine and calpaurine - isolated from leaves along with lupinine, epilupinine, calpurmenine and its pyrrolicarboxylic acid ester, 13-hydroxylupanine and its tiglate, virgiline and its pyrrolicarboxylic acid ester; structures of new compounds determined (*Phytochemistry* 1986, 25, 1443); two new quinolizidine alkaloids - digitine and 4 β ,13 α -dihydroxylupanine - isolated from Ethiopian plant and characterised (*Planta Med.* 1986, 52, 302).

Distribution : Introduced into India and grown in hills of south India.

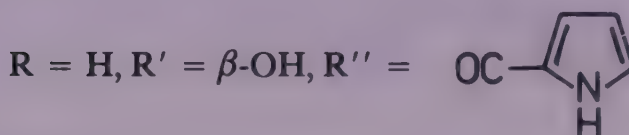
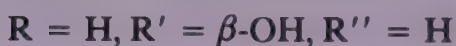
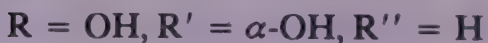
NEW COMPOUNDS



Calpaurine



Digittinine

4 β ,13 α -Dihydroxylupanine3 β ,4 α ,13 α -Trihydroxylupanine

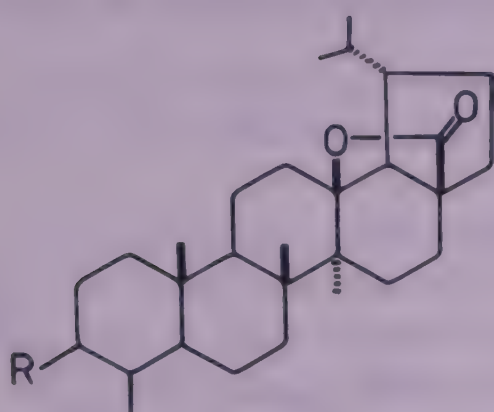
C. lasiogyne E. Mey.; see *C. aurea* (Ait.) Benth. ssp. *aurea*

CALTHA (Ranunculaceae)

C. palustris L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 125).

Isolation and structure elucidation of caltholide and epicaltholide (*Phytochemistry* 1984, 23, 1699); new triterpene lactone - palustrolide - isolated and characterised; hederagenin, 16,17-dihydroxykauran-19-oic acid, hederagenic acid, sitosterol and its glucoside also isolated (*Phytochemistry* 1984, 23, 2082); detection of protoanemonin (0.26 $\mu\text{g/g}$) in plant (*J. Nat. Prod.* 1986, 49, 1172); three triterpenoid saponins - hederagenin-3-O- α -L-arabinopyranoside, hederagenin-3-O- α -rhamnopyranosyl(1 \rightarrow 2)- α -L-arabinopyranoside and oleanolic acid-3-O- α -L-rhamnopyranosyl-(1 \rightarrow 2)- α -L-arabinopyranoside - isolated and characterised (*Planta Med.* 1987, 53, 98).

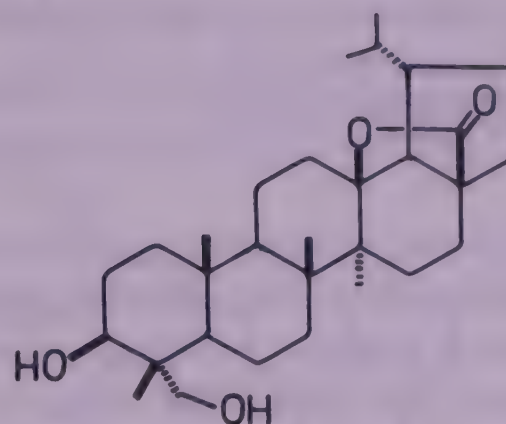
NEW COMPOUNDS



Caltholide

R = β -OH

Epicaltholide

R = α -OH

Palustrolide

CAMELLIA (Theaceae)

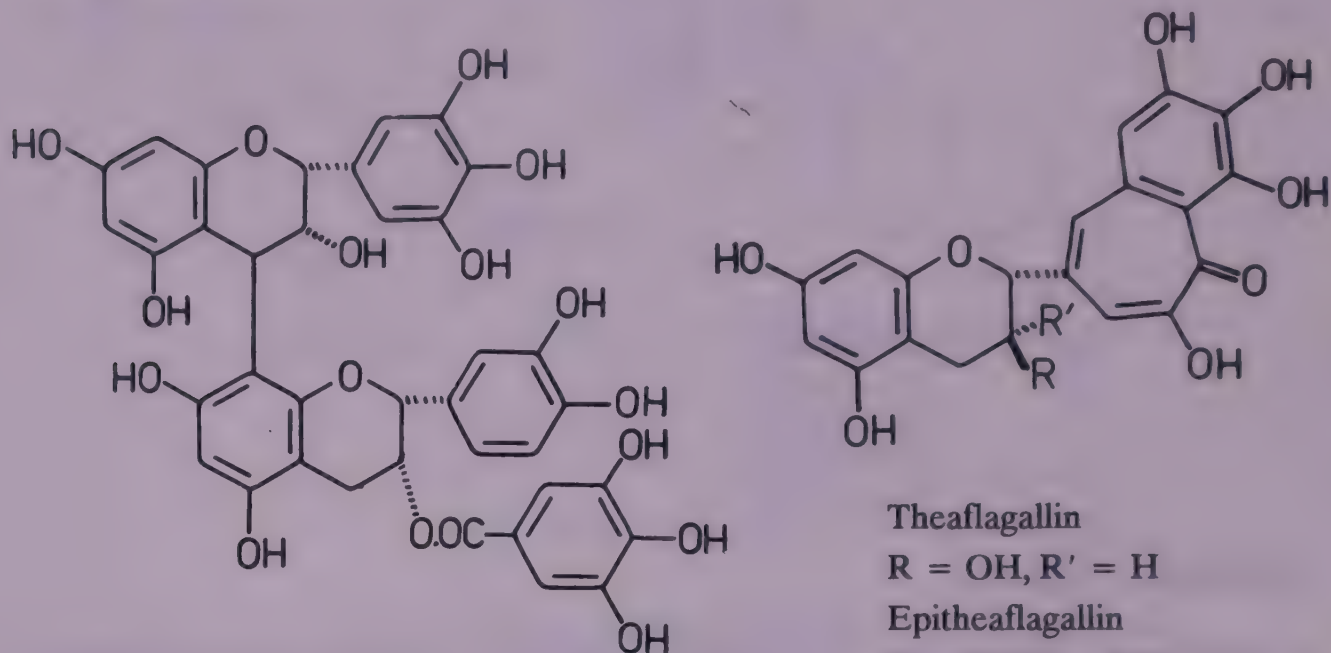
C. sinensis (L.) Kuntze syn. *C. sinensis* (L.) Kuntze var. *assamica* (Mast.) Kitamura, *C. theifera* Griff., *Thea sinensis* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 118).

Decoction of plant used as folk beverage having anti-inflammatory, antihypertensive and sedative activities (*Yaoxue Xuebao* 1987, 22, 203; *Chem. Abstr.* 1987, 107, 46139 h); aqueous extract showed prolonged hypotensive effect in anaesthetised rabbits (*Yakugaku Zasshi* 1988, 108, 77; *Chem. Abstr.* 1988, 108, 179827 y).

Caffeine and theophylline isolated from hulls of seeds (*Khim. Pri. Soedin.* 1984, 670; *Chem. Abstr.* 1985, 102, 42893 y); a new proanthocyanidin gallate - epigallocatechin (4 β →8)-3-O-galloylepicatechin (I) - along with two hydrolyzable tannins - 1,4,6-tri-O-galloyl- β -D-glucose and 1-O-galloyl-4,6-(-)hexahydroxydiphenoyl- β -D-glucose - isolated from leaves and characterised; procyanidins B-2, B-4 and C-1 also isolated (*Phytochemistry* 1984, 23, 1753); vitexin, apigenin-6,8-di-C-glucoside, kaempferol-3- and quercetin-3-rhamnoglucosides isolated from young tea shoots (*Khim. Pri. Soedin.* 1985, 118; *Chem. Abstr.* 1985, 102, 201172 f); synthesis of cis-theaspirane (*Agric. Biol. Chem.* 1985, 49, 861); three new red pigments - epitheafлагallin, epitheafлагallin-3-O-gallate and theafлагallin - isolated together with theaflavin and its 3-O-gallate, 3'-O-gallate and 3,3'-di-O-gallate; structures of new compounds determined (*Chem. Pharm. Bull.* 1986, 34, 61); a growth inhibitor isolated from leaves and identified as ABA (*Subtrop. Kul't* 1986, 81; *Chem. Abstr.* 1987, 106, 81604 g); two new flavonoid glycosides - camellianin A and camellianin B - isolated along with apigenin and characterised (*Yaoxue Xuebao* 1987, 22, 203; *Chem. Abstr.* 1987, 107, 46139 h); castasterone synthesised

(*Agric. Biol. Chem.* 1987, 51, 1909); detection of 1-triacontanol in fresh green leaves by GC-MS; leaves also contained bound triacontanol (0.07-2.45%) (*J. Sci. Food Agric.* 1988, 43, 229; *Chem. Abstr.* 1988, 109, 3825 c).

NEW COMPOUNDS



I

Theaflagallin

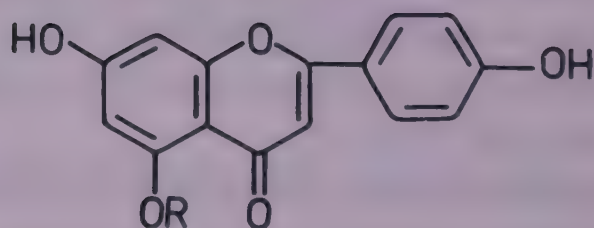
R = OH, R' = H

Epitheafagallin

R = H, R' = OH

Epitheafagallin-3-O-gallate

R = H, R' = O-Galloyl



Camellianin A

R = Glu(6''-Ac)(4→1)Rha

Camellianin B

R = Glu(4→1)Rha

BIOLOGICAL ACTIVITY

(-)-Gallocatechin gallate at a dose of 0.1 mg/kg, i.v., reduced blood pressure in anaesthetised rabbits and at 0.5 mg/kg lowered it by 30 mm Hg for a longer period (*Yakugaku Zasshi* 1988, 108, 77; *Chem. Abstr.* 1988, 108, 179827 y).

C. sinensis (L.) Kuntze var. *assamica* (Mast.) Kitamura; see *C. sinensis* (L.) Kuntze

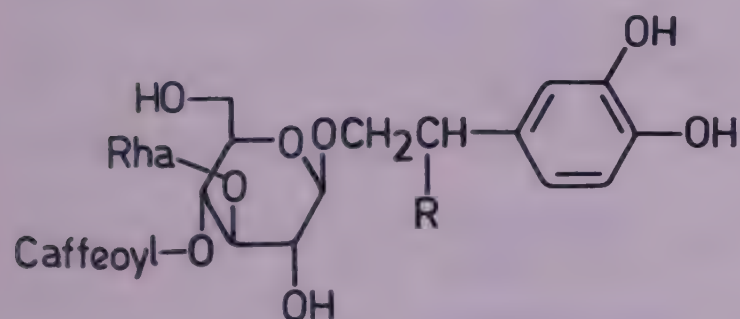
C. theifera Griff.; see *C. sinensis* (L.) Kuntze

CAMPSIS (Bignoniaceae)

C. chinensis Voss; see *C. grandiflora* (Thunb.) K. Schum.

C. grandiflora (Thunb.) K. Schum. syn. *Tecoma grandiflora* (Thunb.) Loisel, *Campsis chinensis* Voss (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 120).

Two new iridoid glucosides - 5-hydroxycampenoside and cachineside I - isolated from leaves along with tecomoside and their structures determined by X-ray studies (*Phytochemistry* 1984, 23, 2263); isolation and structure elucidation of phenyl propanoid glycosides - campneoside I and campneoside II - from leaves along with acetoside (*Phytochemistry* 1985, 24, 139); three new iridoid glucosides - cachinesides III, IV and V - isolated from leaves and their structures established (*Heterocycles* 1986, 24, 2593).

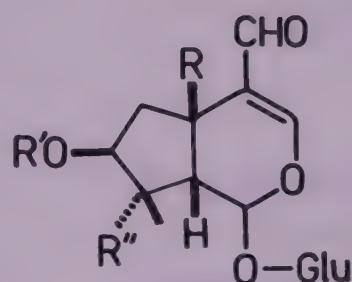
NEW COMPOUNDS

Campneoside I

R = OMe

Campneoside II

R = OH



Cachineside I

R,R',R'' = H

Cachineside III

R = OH, R' = p-Coumaroyl, R'' = OH

Cachineside IV

R,R'' = OH, R' = H

Cachineside V

R,R' = H, R'' = OH

5-Hydroxycampenoside

R = OH, R' = Cinnamoyl, R'' = H

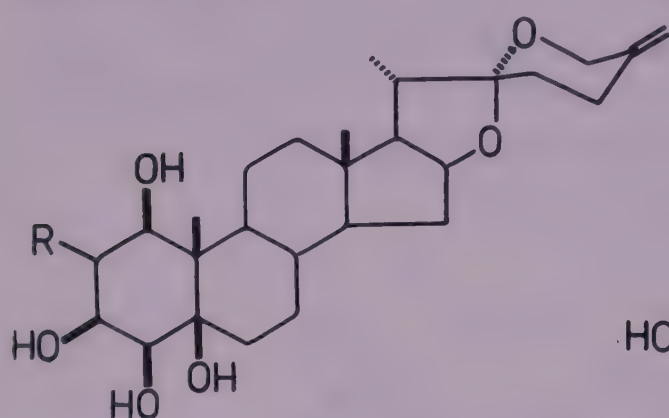
CAMPYLANDRA (Liliaceae)

C. aurantiaca Baker syn. *Tupistra aurantiaca* Wall. ex Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 120).

Three new sapogenins - ranmogenins A, B and C - isolated from roots along with sapogenins A, B, F and G and 1 β ,2 β ,3 β ,4 β ,5 β ,7 α -hexahydroxyspirost-25(27)-en-6-one and

characterised by their ^{13}C -NMR (Yunnan Zhiwu Yanjiu 1987, 9, 217; *Chem. Abstr.* 1987, 107, 194913 w; Yunnan Zhiwu Yanjiu 1987, 9, 374; *Chem. Abstr.* 1988, 108, 147148 m); isolation and ^{13}C -NMR spectra of 3-epiruscogenin, 3-epineoruscogenin, tupisgenin, aurantigenin and pentrogenin-25(27)-ene (Yunnan Zhiwu Yanjiu 1987, 9, 374; *Chem. Abstr.* 1988, 108, 147148 m); ranmogenin D isolated from roots along with pentrogenin-25(27)-ene and characterised (Yunnan Zhiwu Yanjiu 1987, 9, 223; *Chem. Abstr.* 1987, 107, 194914 x; Yunnan Zhiwu Yanjiu 1987, 9, 374; *Chem. Abstr.* 1988, 108, 147148 m).

NEW COMPOUNDS

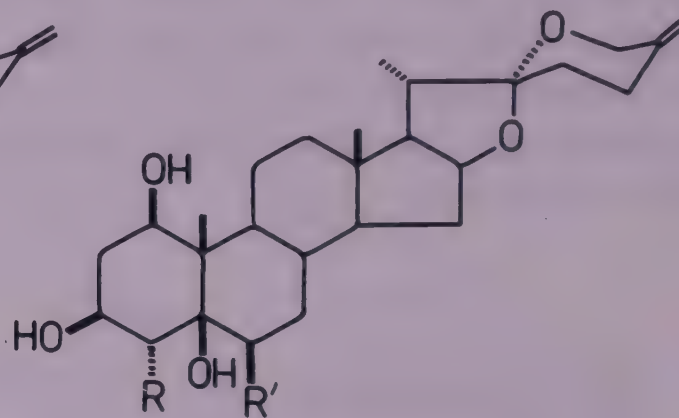


Ranmogenin A

R = H

Ranmogenin D

R = β -OH



Ranmogenin B

R = OH, R' = H

Ranmogenin C

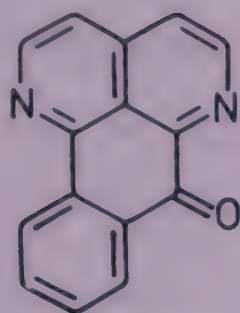
R = H, R' = OH

CANANGA (Annonaceae)

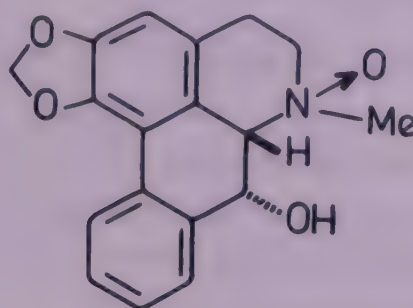
C. odorata Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 127).

A new alkaloid - sampangine - isolated from stem bark along with liriodenine and its structure determined (*J. Nat. Prod.* 1986, 49, 346); germacrene D, α -humulene, γ - and ϵ -cadinenes and γ -muurolene isolated from essential oil and their ^{13}C -NMR spectra studied (*Magn. Reson. Chem.* 1986, 24, 275; *Chem. Abstr.* 1986, 104, 174341 t); detection of α -cedrene, α -amorphene, γ -bisabolene, α -, γ - and δ -cadinols, γ -muurolene and farnesyl acetate in essential oil (*J. Agric. Food Chem.* 1986, 34, 481; *Chem. Abstr.* 1986, 104, 192898 j); isolation and structure elucidation of ushinsanine N-oxide from stem bark (*J. Chin. Chem. Soc.* 1988, 35, 305; *Chem. Abstr.* 1989, 110, 111669 j).

NEW COMPOUNDS



Sampangine



Ushinsanine N-oxide

CANARIUM (Burseraceae)

C. strictum Roxb. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 73).

α -, β -Amyrins, β -amyrin formate, β -amyrin acetate and sitosterol isolated from gum (*J. Indian Chem. Soc.* 1987, 64, 775).

CANAVALIA (Papilionaceae)

C. ensiformis (L.) DC.; see *C. gladiata* (Jacq.) DC.

C. ensiformis (L.) DC. var. *virosa* (Roxb.) Baker; see *C. virosa* (Roxb.) Wight & Arn.

C. gladiata (Jacq.) DC. syn. *C. ensiformis* [auct. (non L.) DC.] (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 121).

Lupeoside isolated from seeds and characterised as lup-20(29)-en-3-O- β -D-xylopyranosyl(1 \rightarrow 4)-O- β -D-glucopyranoside (*Acta Cienc. Indica, Chem.* 1985, 11, 24; *Chem. Abstr.* 1987, 107, 214787 p); defatted seeds yielded crude proteins (18.0%), which contained glycine, alanine, norvaline, serine, proline, histidine, aspartic acid, cystine, glucose, galactose, rhamnose, raffinose, arabinose, glucuronic acid and ascorbic acid (*Acta Cienc. Indica, Chem.* 1985, 11, 60; *Chem. Abstr.* 1987, 107, 130886 g).

C. virosa (Roxb.) Wight & Arn. syn. *C. ensiformis* (L.) DC. var. *virosa* (Roxb.) Baker (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 48).

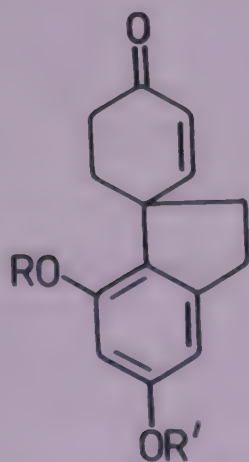
Seed extract (1.0 mg/100 g) potentiated pentobarbitone hypnosis in mice; at 10.0 μ g/ml it markedly degranulated mesenteric mast cells of rats leading to liberation of histamine, which was responsible for hypotension and gastrointestinal symptoms (*Indian J. Pharmacol.* 1986, 18, 84).

CANNABIS (Cannabaceae)

C. sativa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 121).

Herb extract, given orally, inhibited phenylbenzoquinone (PBQ)-induced writhing in mice and when applied topically antagonised tetradecanoylphorbol acetate (TPA)-induced erythema of mouse skin (*Inflammation* 1988, 12, 361; *Chem. Abstr.* 1988, 109, 122008 y).

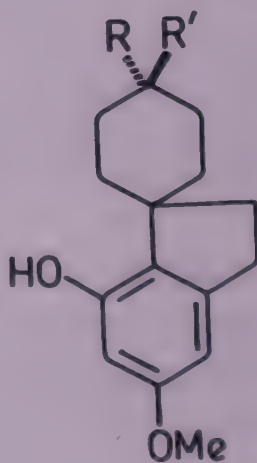
Isolation and structure elucidation of canniprene, cannabispiradienone, cannabispirenone A, cannabispirenone B, α - and β -cannabispiranol, cannithrene 1, cannithrene 2, canniflavone 1, canniflavone 2, 5,4'-dihydroxy-3-methoxydihydrostilbene, 5,3'-dihydroxy-3,4'-dimethoxydihydrostilbene and cannabispirone from leaves of non-flowering plant of Thailand (*J. Chem. Soc. Perkin 1* 1982, 1455); asymmetric synthesis of (+)cannabispirenone A confirmed its absolute configuration as R (*Synth. Commun.* 1984, 14, 599; *Chem. Abstr.* 1985, 102, 6020 c); new prostaglandin production inhibitor - cannflavin - isolated (*Biochem. Pharmacol.* 1985, 34, 2019); synthesis of racemic cannabissativine and racemic anhydrocannabissativine (*Tetrahedron Lett.* 1985, 26, 2237,2241); cannithrene 1 synthesised (*Can. J. Chem.* 1985, 63, 2232); three new spiroindans - 7-hydroxy-5-methoxyindan-1-spirocyclohexane (I), 5-hydroxy-7-methoxyindan-1-spirocyclohexane (II) and 5,7-dihydroxyindan-1-spirocyclohexane (III) - isolated and characterised (*Phytochemistry* 1986, 25, 1992); two new prenylated flavones - cannflavin A and cannflavin B - isolated and their structures determined (*Experientia* 1986, 42, 452); cannabidiol, cannabidiolic acid, 9-dehydro-THC, cannabichroman, cannabicyclol, 8-dehydro-THC, cannabinol and cannabigerol identified in roots by GC/TLC (*Acta Univ. Palacki. Olomuc., Fac. Med.* 1987, 116, 31; *Chem. Abstr.* 1987, 107, 233159 b).

NEW COMPOUNDS**Cannabispirenone A**

R = H, R' = Me

Cannabispirenone B

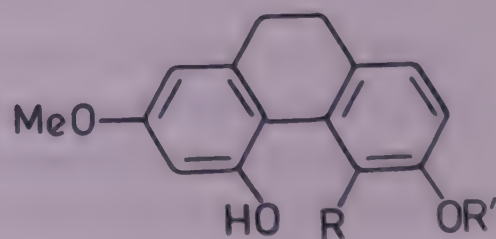
R = Me, R' = H

 **α -Cannabispiranol**

R = OH, R' = H

 β -Cannabispiranol

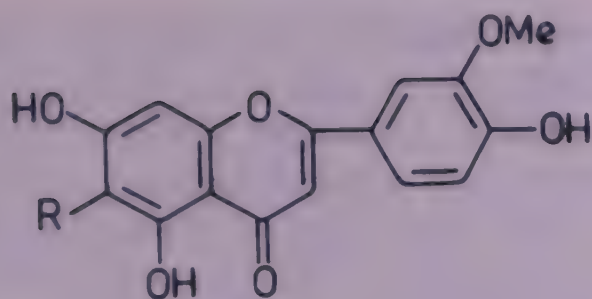
R = H, R' = OH

**Cannithrene 1**

R,R' = H

Cannithrene 2

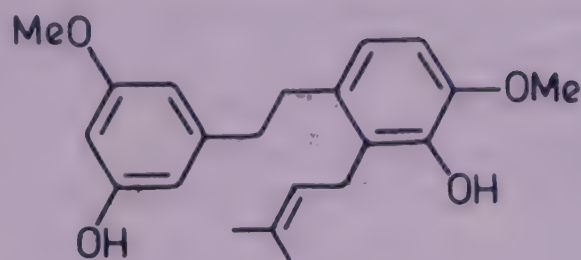
R = OH, R' = Me



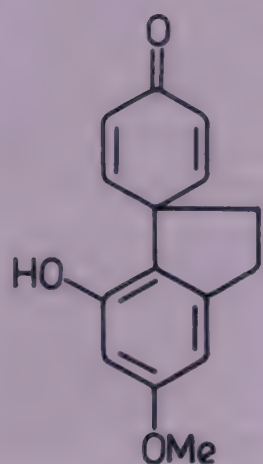
Canniflavone 1

R = $\text{CH}_2\text{CH}=\text{CMe}_2$

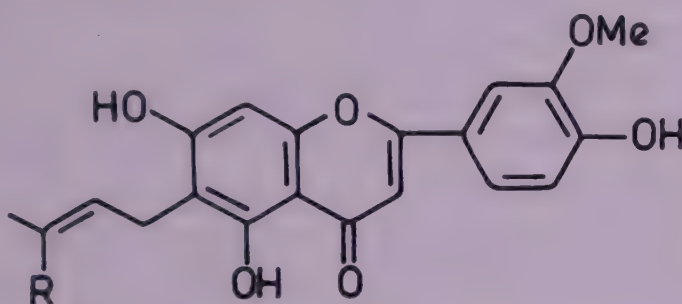
Canniflavone 2

R = $\text{CH}_2\text{CH}=\text{C}(\text{Me})\text{CH}_2\text{CH}_2\text{CH}=\text{CMe}_2$ 

Canniprene



Cannabispiradienone

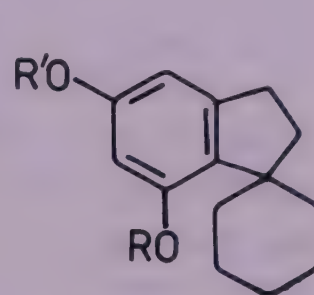


Cannflavin A

R = CHCMe_2

Cannflavin B

R = Me



I

R = H, R' = Me

II

R = Me, R' = H

III

R, R' = H

BIOLOGICAL ACTIVITY

Note : 1-Dehydro-tetrahydrocannabinol (1-dehydro-THC) is frequently referred to in literature as 9-dehydro-tetrahydrocannabinol (9-dehydro-THC) and similarly, 6-dehydro-THC is also mentioned as 8-dehydro-THC. In this write-up also the practice adopted in Vols. 2 & 3 has been followed: namely, 1-dehydro-THC and 6-dehydro-THC are uniformly used for 9-dehydro-THC and 8-dehydro-THC respectively, irrespective of nomenclature used in the cited publications.

1-Dehydro-THC inhibited serotonin release from platelets in plasma obtained from migraine patients during migraine attack (*Int. J. Clin. Pharmacol. Res.* 1985, 5, 243; *Chem. Abstr.* 1985, 103, 206392 h); 1-dehydro-THC (5.0 mg/kg, i.p.) elicited ipsilateral circling behaviour in rats with unilateral nigral lesions produced by 6-hydroxydopamine, which was completely antagonised by haloperidol (0.2 mg/kg) (*Life Sci.* 1985, 37, 2181); 1-dehydro-THC (75.0 mg/kg, i.v.) reduced content of brain tele-methylhistamine in rats. It (0.03 and 0.1 mM) significantly inhibited K^+ -induced release of endogenous histamine from guinea pig

hypothalamic slices, apparently it decreased histamine turnover in brain (*J. Pharmacol. Exp. Ther.* 1985, 232, 513); 1-dehydro-THC (2.0-20.0 μ M) increased the rate, but decreased contractile force and coronary flow of isolated rat heart. Cannabidiol (CBD) at similar concentrations had limited effect on heart rate but increased contractile force and coronary flow; cannabinal (CBN) had little effect on heart. Simultaneous equimolar administration of THC with CBD or CBN antagonises or mitigates cardiac effects of THC on rat. Cardiac effects of THC were significantly potentiated by cocaine in equimolar concentration (*Proc. Oxford Symp. Cannabis* 1985, 347; *Chem. Abstr.* 1986, 104, 14762 c); 1-dehydro-THC was toxic to peripheral blood lymphocytes at 20.0 μ g/ml but not at 10.0 μ g/ml; it also inhibited NK cell activity in human tumor K562 cell line at 5.0 μ g/ml (*Int. J. Immunopharmacol.* 1986, 8, 741; *Chem. Abstr.* 1987, 106, 12570 f); effects of low doses of 1-dehydro-THC were assessed on firing patterns of granule cells in dentate gyrus of rats to tone stimuli, i.p. injection of 1-dehydro-THC at 1.0 and 2.0 mg/kg produced suppression of granule cell activity lasting up to 4 hr. This suppression was present in both spontaneous (pretone) activity and tone-evoked responses of granule cells (*J. Pharmacol. Exp. Ther.* 1986, 239, 941); conditioned behaviour was disrupted up to 2 hr after i.p. injection of 1-dehydro-THC (1.0-2.0 mg/kg); response to rewarded stimulus decreased and latency to respond increased significantly (*J. Pharmacol. Exp. Ther.* 1986, 239, 936); administration of 1-dehydro-THC (2.5 mg/kg/day) in early pregnancy resulted in abortion of three of five pregnancies in rats. These abortions were associated with rapid decrease in chorionic gonadotropin and subsequent fall in progesterone concentration. In two pregnancies that continued until term, estradiol concentrations were higher than in control pregnancies. Daily THC administration during middle or third portion of gestation resulted in less pregnancy loss. (*J. Reprod. Med.* 1986, 31, 1071; *Chem. Abstr.* 1987, 106, 95964 m); 1-dehydro-THC attenuated signs of quasimorphine withdrawal syndrome elicited in rats by administration of phosphodiesterase inhibitor and naloxone. CBN showed equivalent effect at a dose of 8-times that of THC (*Pharmacol. Biochem. Behav.* 1985, 23, 13; *Chem. Abstr.* 1985, 103, 116192 p); 1-dehydro-THC (1.0 μ g) decreased levels of some uterine biochemical components (total lipids, phospholipids, cholesterol and glycogen) of estrogen-primed rats (*Med. Sci. Res.* 1987, 15, 81; *Chem. Abstr.* 1987, 107, 658 y); acute administration of 1-dehydro-THC (50.0 mg/kg) at puberty (35-40 days) significantly reduced Ca^{2+} ATPase activity in hypothalamic plasma membrane in mice but activity was slightly increased in hypothalamic tissue obtained from adult mice. In contrast, testicular Ca^{2+} ATPase activity was increased in pubertal THC-treated males and significantly reduced in adults (*Eur. J. Pharmacol.* 1987, 137, 91); administration of 1-dehydro-THC (50.0 mg/kg or 100.0 mg/kg) to mice bearing herpes simplex virus type 2 (HSV-2) infection resulted in suppression of proliferative response to HSV-2 cell surface antigens expressed on virus-infected mouse embryo fibroblasts. Similar results were obtained also in *in vitro* experiments. Apparently it inhibited immune response to homotypic challenge with HSV-2 (*Immunopharmacol. Immunotoxicol* 1987, 9, 361; *Chem.*

Abstr. 1988, 108, 31801 q); 1-dehydro-THC exhibited immunosuppressive effect against autoimmune encephalomyelitis in experimental rats and guinea pigs, animals showed either no signs or mild signs with delayed onset (13-15 days post-injection) with 95.0% survival; marked reduction of inflammation of central nervous system tissue in THC-treated animals was observed (*J. Neuroimmunol.* 1989, 23, 73; *Chem. Abstr.* 1989, 111, 33315 v).

9-Dehydro-THC markedly suppressed almost all normally-occurring behavioural elements in rats as observed in both small and large open field; it induced a bizarre circling and turning response that was evident over all three test days and occurred even when the rats were deeply sedated (*Psychopharmacology* 1984, 84, 556); CBD showed anxiolytic activity in rats (*Proc. Oxford Symp. Cannabis* 1984, 713; *Chem. Abstr.* 1986, 104, 45600 c); cannabinoids with exception of 9-dehydro-THC and CBN inhibited PBQ-induced writhing in mice exhibiting their maximal effect at ~ 0.1 mg/kg. Cannabinoids were also effective in antagonising TPA-induced erythema of skin. 1-Dehydro-THC and CBN were least effective in this test system also (*Inflammation* 1988, 12, 361; *Chem. Abstr.* 1988, 109, 122008 y); cannabigerol, CBD, CBN and 9-dehydro-THC partially inhibited primary aggregation and totally inhibited secondary aggregation of human platelets, when adrenaline was used as an agonist. Inhibition was dose dependent over the range of 0.01-1.0 mM (*J. Pharm. Pharmacol.* 1989, 41, 705); cannflavins A and B inhibited prostaglandin E₂ production *in vitro* by human rheumatoid synovial cells (*Experientia* 1986, 42, 452).

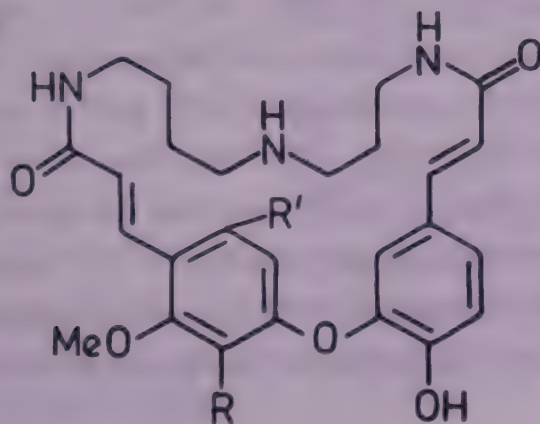
CAPPARIS (Capparaceae)

C. aphylla Roth; see *C. decidua* (Forsk.) Edgew.

C. decidua (Forsk.) Edgew. syn. *C. aphylla* Roth (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 137).

A new spermidine alkaloid - capparidisine - isolated from root bark and its structure elucidated (*Heterocycles* 1985, 23, 3015; *Ann. Chem.* 1987, 161); isolation and structure determination of capparisine from root bark (*Z. Naturforsch.* 1986, 41B, 1033; *Chem. Abstr.* 1986, 105, 187587 x); capparisinine isolated from root bark and characterised (*Ann. Chem.* 1987, 161).

NEW COMPOUNDS



Capparidisine

R = OMe, R' = H

Capparisine

R, R' = H

Capparisinine

R = H, R' = OMe

C. horrida L.f.; see *C. zeylanica* L.

C. spinosa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 132).

Cappaprenol 12, cappaprenol 13 and cappaprenol 14 isolated (*Pharmazie* 1988, 43, 640; *Chem. Abstr.* 1989, 110, 18250 f); glucobrassicin, neoglucobrassicin and 4-methoxyglucobrassicin identified in roots by HPLC (*Phytochemistry* 1988, 27, 259).

BIOLOGICAL ACTIVITY

Cappaprenol 13 inhibited carrageenin-induced (44.0) and oxyphenbutazone-induced (67.0%) paw oedema in rats (*Pharmazie* 1988, 43, 640; *Chem. Abstr.* 1989, 110, 18250 f).

C. zeylanica L. syn. *C. horrida* L.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 50).

β -Carotene isolated from leaves (*Indian Drugs* 1985, 22, 4199).

CAPSELLA (Brassicaceae)

C. bursa-pastoris (L.) Medik. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 132).

BIOLOGICAL ACTIVITY

Rutin exhibited significant antimicrobial activity against *Staphylococcus aureus*, *Klebsiella pneumoniae*, *Escherichia coli*, *Candida monosa* and *Sarcina lutea* (*Farm. Glas.* 1988, 44, 111; *Chem. Abstr.* 1988, 109, 70423 h).

CAPSICUM (Solanaceae)

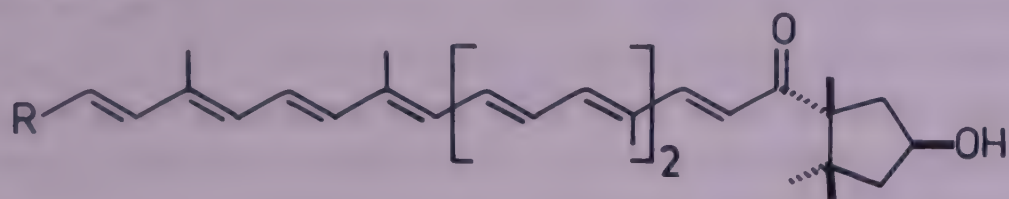
C. annuum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 133).

Carotenoid fraction at 2.0-5.0 g/kg dose, p.o., showed anti-inflammatory activity and enhanced wound healing in mice and rats (*Farm. Zh. (Kiev)* 1985, 50; *Chem. Abstr.* 1986, 104, 85415 c).

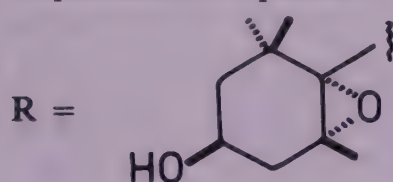
Lutein, capsorubin, cryptoxanthin, capsanthin, rubixanthin and phytofluene isolated from fruits (*Farm. Zh. (Kiev)* 1985, 50; *Chem. Abstr.* 1986, 104, 85415 c); capsanthin-5,6-epoxide, capsanthin-3,6-epoxide and capsochrome isolated and characterised (*Tetrahedron Lett.* 1986, 27, 2535); three new steroid glycosides - capsicosides A1, B1 and C1 - isolated from roots and their structures elucidated (*Khim. Pri. Soedin.* 1986, 708; *Chem. Abstr.* 1987, 106, 192742 v); two tigogenin glycosides - capsicosides A2 and B2 - and two diosgenin glycosides - capsicosides A3 and B3 - isolated from roots and characterised as 3-O- β -D-galactopyranosyl- (25R) 5 α -spirostan-3 β -ol, 3-O- β -D-glucopyranosyl(1 \rightarrow 4)- β -D-galactopyranosyl-(25R) 5 α -spirostan-3 β -ol, 3-O- β -D-galactopyranosyl-(25R)spirost-5-en-3 β -ol and funkioside C respectively

(*Khim. Prir. Soedin.* 1987, 242; *Chem. Abstr.* 1987, 107, 112624 r); capsicosin D1 (gitonin) and capsicosin E1 isolated from roots and their structures elucidated (*Khim. Prir. Soedin.* 1987, 309; *Chem. Abstr.* 1987, 107, 93504 h; *F.E.C.S. Int. Conf. Chem. Biotechnol. Biol. Act. Nat. Prod.* [Proc.] 3rd, 1987, 5, 436; *Chem. Abstr.* 1989, 110, 36723 s).

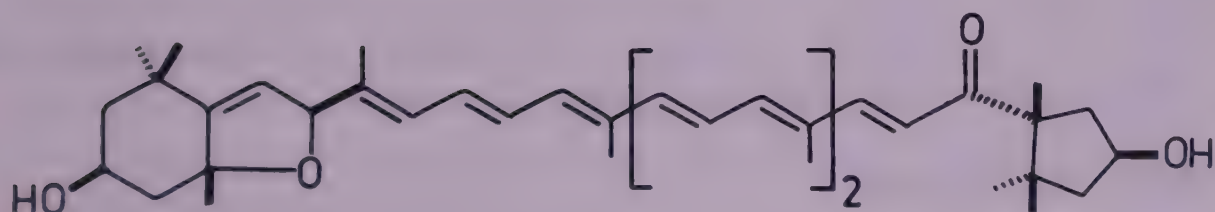
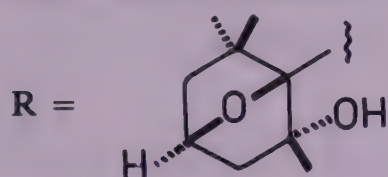
NEW COMPOUNDS



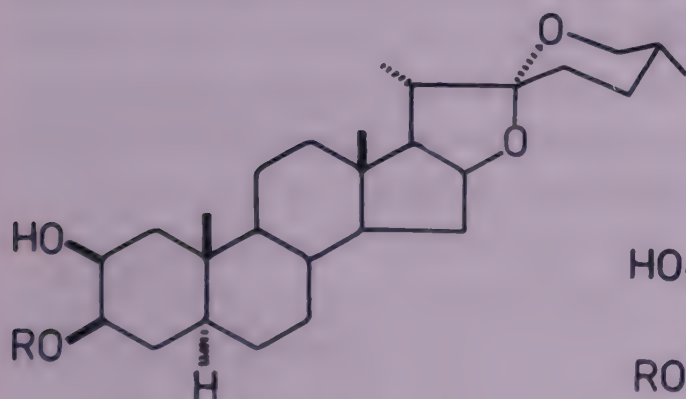
Capsanthin 5,6-epoxide



Capsanthin 3,6-epoxide



Capsochrome



Capsicoside A1

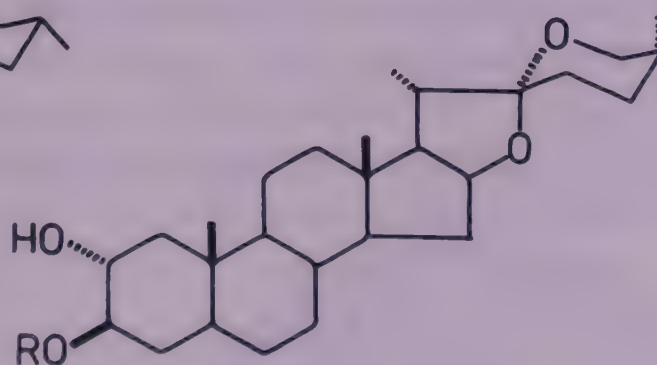
R = Gal

Capsicoside B1

R = Gal(4→1)Glu

Capsicoside C1

R = Gal(4→1)Glu(3→1)Xyl



Capsicosin D1

R = Gal(4→1)Glu[(2→1)Gal](3→1)Xyl

Capsicosin E1

R = Gal(4→1)Glu[(2→1)Gal(4→1)Glu](3→1)Xyl

BIOLOGICAL ACTIVITY

Capsaicin ($3.3 \mu\text{M}$) released acetylcholine from isolated myenteric plexus longitudinal muscle strips of guinea pig ileum, pre-incubated with choline (*Eur. J. Pharmacol.* 1985, 110, 125); capsaicin pretreatment reduced gastric acid secretion elicited by s.c. injection of histamine (0.1, 0.5 or 5.0 mg/kg) but did not affect responses to carbachol (4.0, 40.0 or 160.0 $\mu\text{g/kg}$) and pentagastrin (25.0 or 250.0 mg/kg) in conscious rats (*Eur. J. Pharmacol.* 1986, 123, 321); capsaicin (0.1 mg/kg, i.v.) caused rapid fall in blood pressure followed by marked pressor response, bradycardia and apnea in rats. It also induced pressor response in pithed rats. In isolated guinea pig trachea, capsaicin ($100.0 \mu\text{M}$) induced contractile response (*Nippon Yakurigaku Zasshi* 1986, 88, 339; *Chem. Abstr.* 1987, 106, 12347 p).

C. annuum L. var. *grossum* (Willd.) Sendt. syn. *C. grossum* Willd. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 140).

Glycosides of geranyl-linalool derivatives isolated from fruits (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1988, 30, 173; *Chem. Abstr.* 1989, 111, 74782 p).

C. grossum Willd.; see *C. annuum* L. var. *grossum* (Willd.) Sendt.

CARAGANA (Papilionaceae)

C. pygmaea (L.) DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 141).

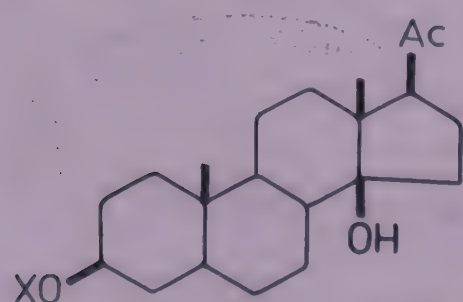
Narcissin, rutin, quercetin, its 3'-glucoside and 3-methyl ether isolated (*Khim. Pri. Soedin.* 1985, 268; *Chem. Abstr.* 1985, 103, 34906 k).

CARALLUMA (Asclepiadaceae)

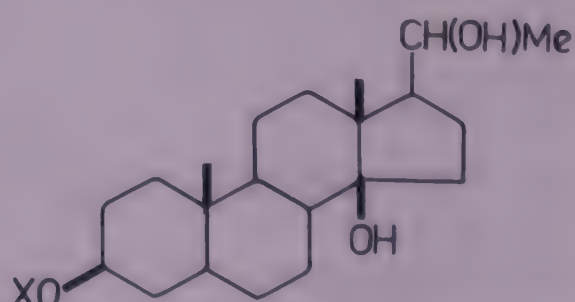
C. tuberculata N.E. Brown syn. *Boucerosia aucheriana* Decne. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 77).

Two new pregnane glycosides - caratubersides A and B - isolated and their structures elucidated (*J. Nat. Prod.* 1988, 51, 1092); isolation and structure determination of boucerosides AI, AII, BI and BII from aerial parts (*Phytochemistry* 1988, 27, 3919).

NEW COMPOUNDS

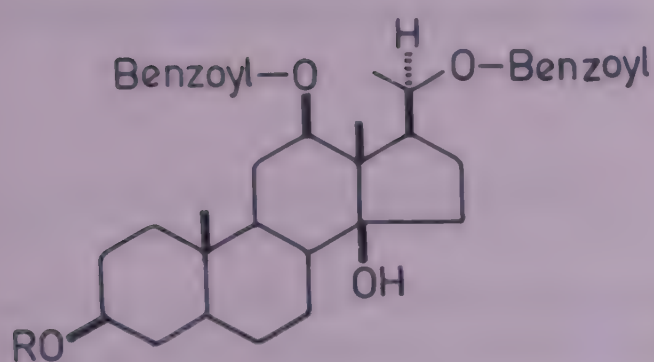


Caratuberside A



Caratuberside B

X = Gal[3-OMe,6-deoxy](4→1)Glu



Bouceroside A1

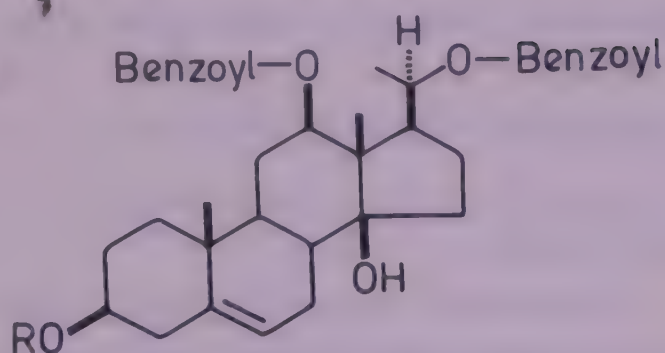
R = X

Bouceroside B1

R = Y

X = Cymarose(4→1)Oleandrose(4→1)Allose[3-OMe,6-deoxy](4→1)Glu

Y = Cymarose(4→1)Cymarose(4→1)Allose[3-OMe,6-deoxy](4→1)Glu



Bouceroside AII

R = X

Bouceroside BII

R = Y

CARDANTHERA (Acanthaceae)*C. triflora* Buch.-Ham. ex Benth.; see *Hygrophila difformis* (L.f.) Blume**CARDIOSPERMUM** (Sapindaceae)*C. helicacabum* L. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 134).Alcoholic and aqueous extracts *in vitro* prevented cellular and extracellular injuries by stabilising lysosomal membrane and prevented enzyme leakage (Arogya 1984, 10 57).

Fatty acid content of seed oil 19.5-23.5% (An. Assoc. Quim. Argent. 1986, 74, 571; Chem. Abstr. 1987, 106, 99443 p); (+)pinitol, 7-O-glucuronides of apigenin, chrysoeriol and luteolin isolated from leaves (Acta Cienc. Indica, Chem. 1987, 13, 169; Chem. Abstr. 1989, 111, 54183 r).

CARDUUS (Asteraceae)*C. pycnocephalus* L.

Kaempferol and its 3,4'-dimethyl ether-7-O-glucoside, apigenin and its 7-O-glucoside isolated from aerial parts (Fitoterapia 1985, 56, 61).

Distribution : Kashmir.

CARICA (Caricaceae)*C. candamarcensis* Hook.f.

Eng. - Mountain papaya; Tel. - Kondapapaya.

Ethyl 3-mercaptopropanoate, ethyl 4-hydroxy and 4-acetoxybutanoates, methyl (E)2- and (E)3-octenoates, butyl and hexyl (E)2-butenates, butyl 2-furoate and butyl nicotinate



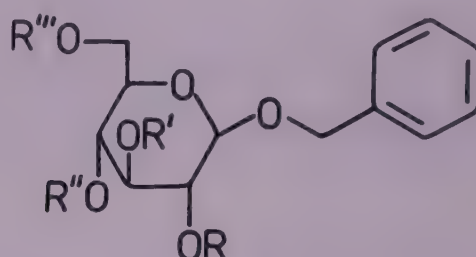
identified in fruits by GC-MS (*J. Agric. Food. Chem.* 1985, 33, 663; *Chem. Abstr.* 1985, 103, 34852 q).

Distribution : Nilgiris, alt. 1300-2100 m.

C. papaya L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 135).

Four isomeric malonated benzyl- β -D-glucosides (I, II, III and IV) isolated as permethylated derivatives from pulp along with benzyl- β -D-glucoside, 2-phenylethyl- β -D-glucoside, 4-hydroxyphenyl-2-ethyl- β -D-glucoside (*Phytochemistry* 1988, 27, 1813).

NEW COMPOUNDS



I

R = Malonyl, R', R'', R''' = H

II

R, R'', R''' = H, R' = Malonyl

III

R, R', R''' = H, R'' = Malonyl

IV

R, R', R'' = H, R''' = Malonyl

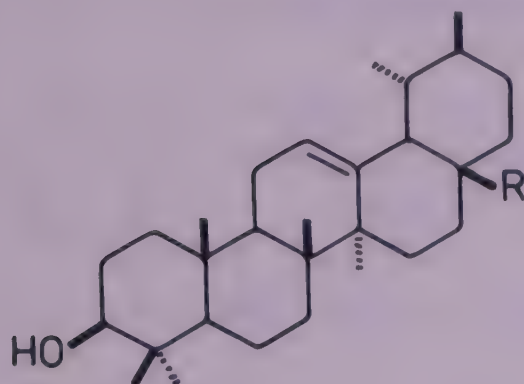
CARISSA (Apocynaceae)

C. carandas L.; see *C. conjesta* Wight

C. conjesta Wight syn. *C. carandas* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 136).

A new triterpene alcohol - carissol - isolated from fruits and its structure established (*Pakistan J. Sci. Ind. Res.* 1985, 28, 378; *Chem. Abstr.* 1986, 104, 183289 j); glucose, galactose, serine, glutamine, alanine, valine, phenylalanine and glycine identified in fruits (*Pakistan J. Sci. Ind. Res.* 1986, 29, 350; *Chem. Abstr.* 1987, 106, 172929 h); isolation and structure determination of carissic acid from fruits and leaves (*Pakistan J. Sci. Ind. Res.* 1988, 31, 753; *Chem. Abstr.* 1989, 111, 36626 h).

NEW COMPOUNDS



Carissol

R = Me

Carissic acid

R = COOH

CARPESIUM (Asteraceae)

C. abrotanoides L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 137).

Isoivaxillin, telekin, 11(13)-dihydrotelekin and carabrone isolated (Zhiwu Xuebao 1988, 30, 71; *Chem. Abstr.* 1988, 109, 107708 h); estimation of β -bisabolene (20.13), dihydroactinidiolide (2.19), γ -nonalactone (1.39), α -terpineol (1.38), 2-hydroxy-4-methoxyacetophenone (1.16), trans-asarone (1.13) and cuparene (1.02%) in fruit essential oil (*Nippon Nogei Kagaku Kaishi* 1989, 63, 185; *Chem. Abstr.* 1989, 110, 179345 f).

CARTHAMUS (Asteraceae)

C. lanatus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 137).

Extract of leaves showed central nervous system depressant activity.

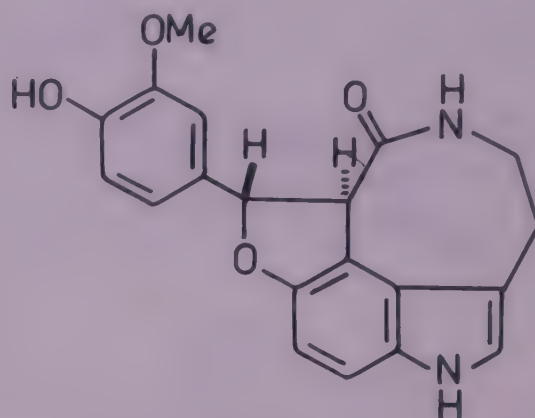
p-Hydroxybenzoic, vanillic and p-coumaric acids isolated from leaves both in free and combined forms (*Plant. Med. Phytother.* 1986, 20, 25; *Chem. Abstr.* 1986, 105, 72122 a).

C. tinctorius L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 138).

Luteolin and its 7-O-glucoside, β -sitosterol and its glucoside isolated from flowers (*Dokl. Akad. Nauk Az. SSR* 1985, 41, 61; *Chem. Abstr.* 1985, 103, 34895 f); new indole alkaloid - serotobenine - isolated from seeds along with N-feruloyltryptamine and N-(p-coumaroyl) tryptamine and its crystal structure determined (*Agric. Biol. Chem.* 1985, 49, 2969); dipalmitin,

linoleic acid, oleic acid and β -sitosterol-3-O-glucoside identified (*Zhongyao Tongbao* 1986, 11, 106; *Chem. Abstr.* 1986, 104, 161702 m).

NEW COMPOUNDS



Serotobenine

BIOLOGICAL ACTIVITY

Safflor yellow A (0.55-1.0 g/kg, i.p.) showed sustained analgesic action. It markedly inhibited formaldehyde-induced foot swelling, formation of cotton ball granuloma and histamine-stimulated capillary permeability in rats. It greatly enhanced barbital and chloral hydrate-induced CNS inhibition but markedly reduced coramine-induced convulsion and death in mice. The i.p. and oral LD₅₀ in mice were 5.49 and 5.53 g/kg respectively. Thus, it appears to possess analgesic, anti-inflammatory, sedative and anticonvulsant effects (*Zhongcaoyao* 1984, 15, 348; *Chem. Abstr.* 1985, 102, 538 f).

CARUM (Apiaceae)

C. anethifolium (D.Don) Clarke; see *Trachyspermum anethifolium* (D.Don) Wolff

C. carvi L. syn. *C. gracile* Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 139).

Optically pure (S)(+)carvone isolated from fruit essential oil (*Flavour Fragrance J.* 1987, 2, 95; *Chem. Abstr.* 1988, 109, 20290 s); germacrene-D and β -elemene as major constituents in seed oil of Israeli plant; oil content of seeds increased rapidly with maturity of plant (*Dev. Food Sci.* 1988, 18, 33; *Chem. Abstr.* 1988, 109, 134805 u).

BIOLOGICAL ACTIVITY

Carveol showed antiasthmatic and antianaphylactic effects in guinea pigs (*Zhejiang Yike Daxue Xuebao* 1988, 17, 115; *Chem. Abstr.* 1989, 110, 225316 x).

C. copticum Benth. & Hook.; see *Trachyspermum ammi* (L.) Sprague

C. gracile Lindl.; see *C. carvi* L.

CASIMIROA (Rutaceae)

C. edulis Llave & Lex (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 140).

Isopimpinellin, casimiroin, skimmianine, 1-methyl-2-phenyl-4-quinolone, edulein, scopoletin methyl ether, hentriacontane and carnaubyl ceroate isolated from leaves and twigs (*J. Nat. Prod.* 1985, 48, 146).

BIOLOGICAL ACTIVITY

Hentriacontane exhibited diuretic and anti-inflammatory activities in rats (*J. Nat. Prod.* 1985, 48, 146).

CASSIA (Caesalpinaceae)

C. absus L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 147).

Raffinose (0.25%) isolated from seeds (*J. Chem. Soc. Pak.* 1986, 8, 429; *Chem. Abstr.* 1987, 106, 15787 t).

C. acutifolia Delile (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 147).

Chrysophanol, physcion, emodin, aloe-emodin, rhein, chrysophanein, physcionin, glucoaloe-emodin, emodin-8-O- β -D-glucoside, glucorhein and sennidin C isolated from dry roots (*Khim.-Farm. Zh.* 1985, 19, 569; *Chem. Abstr.* 1985, 103, 51212 y).

C. alata L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 140).

Palmitic, oleic and linoleic acids identified in seed oil; sterol fraction contained β -sitosterol (41.0), stigmasterol (27.0), 22-dihydrospinaesterol (17.0), campesterol (8.5) and 28-isoavenasterol (5.2%) (*Rev. Fr. Corps Gras* 1986, 33, 381; *Chem. Abstr.* 1987, 106, 153064 f).

C. angustifolia Vahl; see *C. senna* L. var. *senna*

C. fistula L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 140).

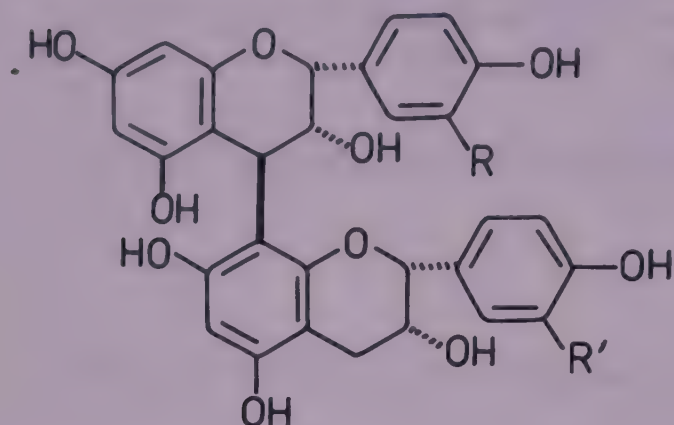
Aurantiamide acetate (0.011), β -sitosterol (0.006) and its β -D-glucoside (0.02%) isolated from flowers (*J. Indian Chem. Soc.* 1986, 63, 448); seed oil contained vernolic (6.1), sterculic (2.0) and malvalic (1.5%) acids (*J. Oil Technol. Assoc. India* 1987, 19, 41; *Chem. Abstr.* 1988, 109, 208271 r); seven new biflavonoids (I-VII) and two triflavonoids (VIII and IX) isolated from leaves and characterised; (-)epicatechin, procyanidin B-2, (-)epiafzelechin and its 3-O-glucoside also isolated (*Chem. Pharm. Bull.* 1988, 36, 39); isolation and structure determination of 5,7,3',4'-tetrahydroxy-6,8-dimethoxyflavone-3-O- α -L-arabinopyranoside, 5,7,4'-tri-

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hydroxy-6,8,3'-trimethoxyflavone-3-O- α -L-rhamnosyl(1 \rightarrow 2)- β -D-glucopyranoside and 1,8-dihydroxy-3,7-dimethoxyxanthone-4-O- α -L-rhamnosyl(1 \rightarrow 2)- β -D-glucopyranoside from stem bark (*Indian J. Chem.* 1989, 28B, 282).

NEW COMPOUNDS



I

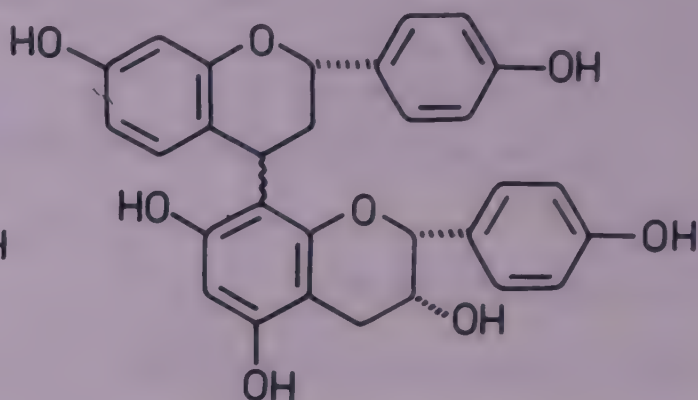
R,R' = H

II

R = H, R' = OH

III

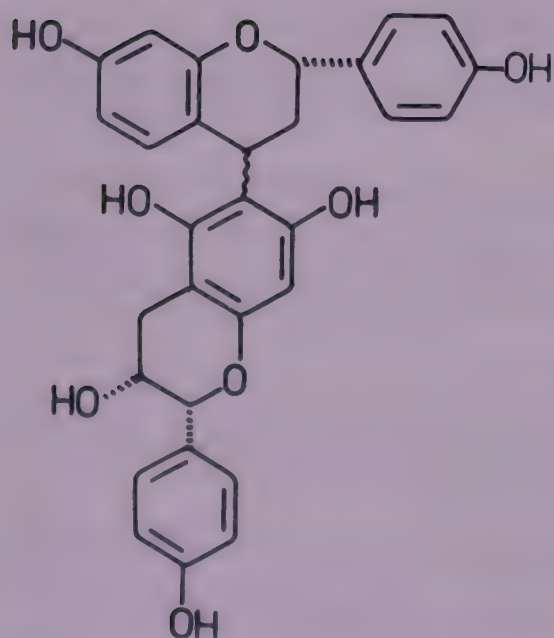
R = OH, R' = H



IV

~ = β

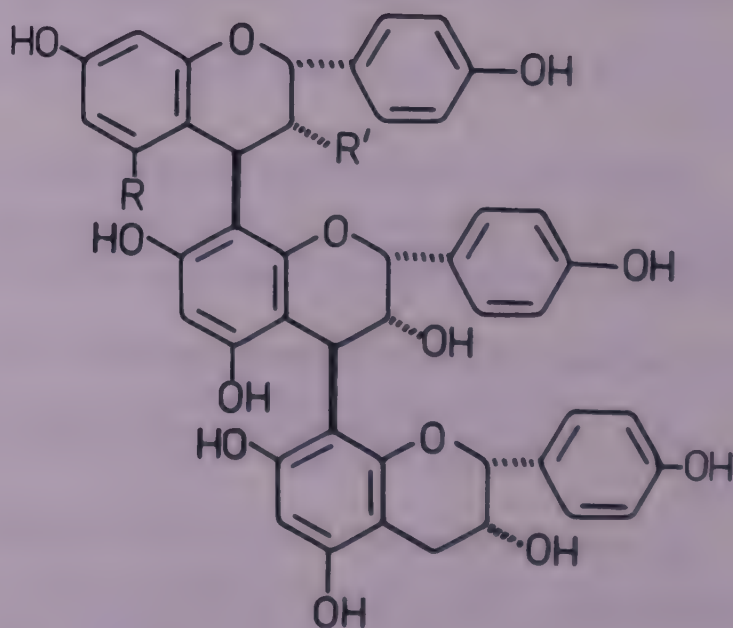
V

~ = α 

VI

~ = β

VII

~ = α 

VIII

R,R' = OH

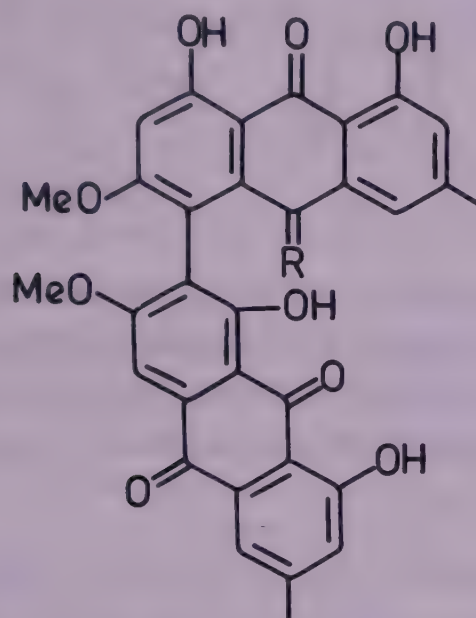
IX

R,R' = H

C. floribunda Cav. syn. *C. laevigata* Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 141).

Two new leucoanthocyanins isolated from stem and characterised as leucocyanidin-7,4'-O-dimethyl-3-O- β -D-glucoside and leucocyanidin-7,4'-O-dimethyl-3-O-rutinoside (*J. Nepal Chem. Soc.* 1981, 1, 68; *Chem. Abstr.* 1985, 103, 138526 c); isolation of floribundone 1 and floribundone 2 from leaves, along with N1,N8-dibenzoylspermidine and physcion and determination of their structures (*Phytochemistry* 1988, 27, 3255).

NEW COMPOUNDS



Floribundone 1

R = O

Floribundone 2

R = H,H

C. grandis L.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 141).

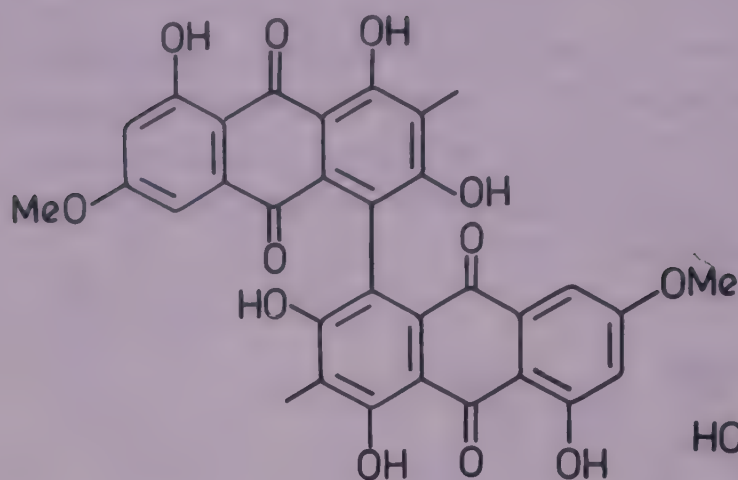
Aloe-emodin isolated from leaves (*J. Sci. Soc. Thailand* 1984, 10, 189; *Chem. Abstr.* 1985, 102, 92993 c).

C. hirsuta L.

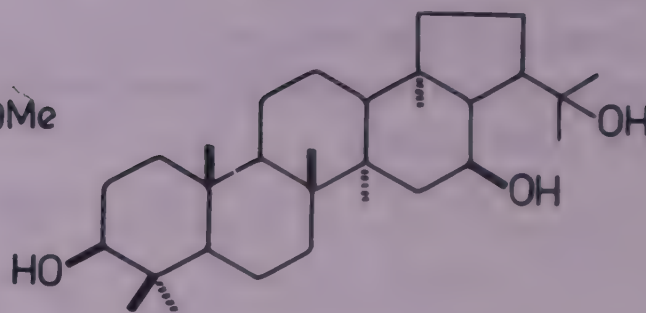
A new bianthraquinone - 4,4'-bis(1,3,8-trihydroxy-6-methoxy-2-methyl)anthraquinone (I) - and a new triterpenoid - 3 β ,16 β ,22-trihydroxyisohopane - isolated from seeds and their structures determined (*Phytochemistry* 1986, 25, 1985; *F.E.C.S. Int. Conf. Chem. Biotechnol. Biol. Act. Nat. Prod.* 3rd 1987, 5, 171; *Chem. Abstr.* 1989, 110, 21064 d).

Distribution : Introduced into India, grows wild in Bihar, north-east India and peninsular India in plains. Also grown as cover crop in coffee plantations in Tamil Nadu.

NEW COMPOUNDS



I

3 β ,16 β ,22-Trihydroxyisohopane

C. holosericia Fresen.

Hentriacontane, ceryl alcohol, α - and β -amyrins, β -sitosterol and betulin isolated from aerial parts; glucose, fructose, aspartic acid, glutamic acid, glycine, valine and arginine identified (*J. Pharm. (Pakistan)* 1985, 3, 101; *Chem. Abstr.* 1986, 104, 65916 p).

Distribution : Introduced into India (*Wealth of India* Vol. 3: Ca-Ci (Revised Edn.) PID, New Delhi, 1992, p. 362).

C. italica (Mill.) Lam. ex F.W.Andr. syn. *C. obovata* (L.) Collad. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 82).

Sennosides A and B isolated from Iranian plant (*Iran J. Chem. Eng.* 1985, 5, 68; *Chem. Abstr.* 1986, 104, 10451 c).

C. javanica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 141).

Rimuene, myricyl alcohol, pentacosanoic acid, methyl behenate, heptacosane, tetra-cosane and isostearic acid isolated from leaves (*Indian J. Pharm. Sci.* 1985, 47, 172); a polysaccharide composed of galactose and mannose in molar ratio of 1:2 isolated from seeds (*Polish J. Chem.* 1987, 61, 805; *Chem. Abstr.* 1988, 108, 219034 w); nonacosane, triacontane, butyrospermone, β -sitosterol-palmitate, -behenate and -arachidate, behenic acid, β -amyrin palmitate, emodin, rhein, chrysophanic acid and kaempferol-3-O- β -D-glucosyl-6-O- α -L-rhamno-pyranoside isolated from leaves (*J. Nat. Prod.* 1987, 50, 1183); two new anthraquinones - 1,3,5,8-tetrahydroxy-6-methoxy-2-methylantraquinone and 1,2-dihydro-1,3-dihydroxy-6,8-dimethoxy-2-methylantraquinone - isolated from stem bark (*Indian J. Chem.* 1988, 27B, 858).

C. laevigata Willd.; see *C. floribunda* Cav.

C. marginata Roxb.; see *C. roxburghii* DC.

C. mimosoides L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 149).

Chrysophanol isolated from stem and leaves (*Planta Med.* 1985, 51, 540); n-hentriacontanol, chrysophanol and an unidentified anthraquinone isolated from aerial parts (*J. Indian Chem. Soc.* 1986, 63, 619).

C. nodosa Buch.-Ham. ex Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 143).

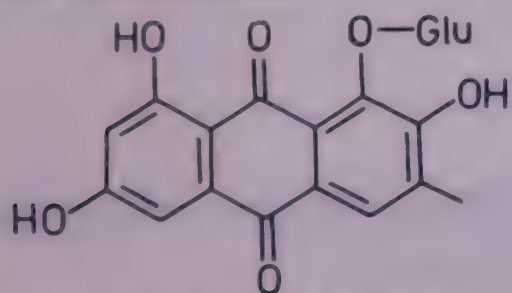
A new anthraquinone isolated from roots and characterised as 1,4-dihydroxy-8-methoxy-2-methylanthraquinone-3-O- β -D-glucopyranoside (*J. Bangladesh Acad. Sci.* 1986, 10, 203; *Chem. Abstr.* 1987, 106, 64308 w).

C. obovata (L.) Collad.; see *C. italica* (Mill.) Lam. ex F.W.Andr.

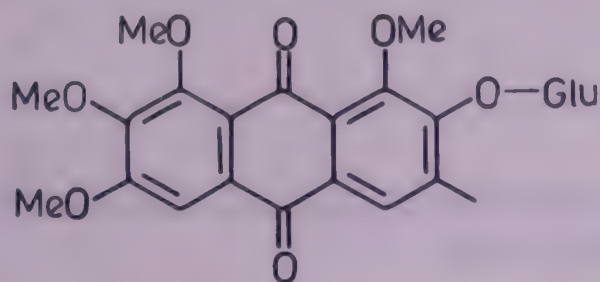
C. obtusifolia L. syn. *C. tora* auct. (non L.) p.p. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 143).

Emodin isolated from leaves (*Indian J. Pharm. Sci.* 1984, 46, 141); two new anthraquinones - alaternin-1-O- β -D-glucopyranoside and chrysoobtusin-2-O- β -D-glucopyranoside - isolated from seeds and characterised; physcion-8-O- β -D-glucoside also isolated (*Chem. Pharm. Bull.* 1985, 33, 1274); obtusin, obtusifolin, stigmaterol, histidine, chrysoobtusin, cystine, γ -hydroxyarginine and aspartic acid isolated (*Proc. Indian Acad. Sci., Plant Sci.* 1986, 96, 321); detection of gibberellins A3, A4 and A7 in anthers (*Trans. Bose Res. Inst. Calcutta* 1986, 49, 29; *Chem. Abstr.* 1988, 109, 51694 f); helminthosporin, O-methylchrysophanol, betulinic acid and 2,5-dimethoxybenzoquinone isolated from roots and seeds, aloe-emodin from roots only and questin, isotalactone, toralactone and torosachrysone isolated from seeds only (*Yakugaku Zasshi* 1986, 106, 302; *Chem. Abstr.* 1986, 105, 85022 t); steam-volatile oil (0.014%) from seeds contained dihydroactinidiolide, m-cresol, 2-hydroxy-4-methoxyacetophenone, methyl palmitate and methyl oleate; free acidic and saponified matter of hexane extract of seeds contained palmitic, oleic and linoleic acids as major constituents whereas unsaponifiable matter consisted of C16-31 alkanes, cholesterol, stigmaterol, β -sitosterol and 1,3-dihydroxy-8-methylanthraquinone (*Kinki Daigaku Rikogakubu Kenkyu Hokoku* 1987, 103; *Chem. Abstr.* 1988, 109, 20269 s).

NEW COMPOUNDS



Alaternin-1-O- β -D-glucoside



Chrysoobtusin-2-O- β -D-glucoside

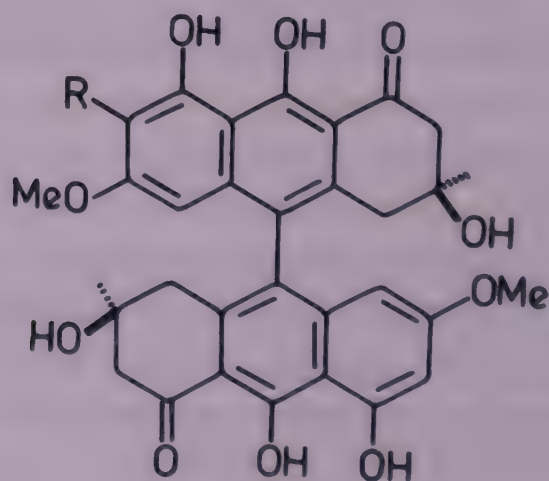
BIOLOGICAL ACTIVITY

Emodin showed purgative action in mice and at a dose of 50.0 mg/kg it was more effective than calcium sennosides A and B at 2.5 mg/kg (*Indian J. Pharm. Sci.* 1984, 46, 141); aloe-emodin, questin, isotoralactone, toralactone and torosachryson showed antimicrobial activity (*Yakugaku Zasshi* 1986, 106, 302; *Chem. Abstr.* 1986, 105, 85022 t).

C. occidentalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 144).

Islandicin, chrysophanol, physcion, emodin, questin, chrysophanol-10,10'-bianthrone, germichryson, methylgermitosone and pinselin isolated from roots as well as callus culture (*Chem. Pharm. Bull.* 1985, 33, 971; *ibid.* 1989, 37, 511); isolation and structure elucidation of 7-methylphyscion and 7-methyltorosachryson from callus culture (*Chem. Pharm. Bull.* 1985, 33, 971); two new flavonoid glycosides - 3,5,3',4'-tetrahydroxy-7-methoxyflavone-3-O-(2''-rhamnosylglucoside) and 5,7,4'-trihydroxy-3,6,3'-trimethoxyflavone-7-O-(2''-rhamnosylglucoside) - isolated from pods and characterised (*Planta Med.* 1985, 51, 525); palmitic, oleic and linoleic acids identified in seed oil; sterol fraction contained β -sitosterol (40.5), stigmasterol (25.0), 22-dihydrospinasterol (16.5), campesterol (10.5) and 28-isoavenasterol (6.0%) (*Rev. Fr. Corps Gras* 1986, 33, 381; *Chem. Abstr.* 1987, 106, 153064 f); occidentalol I and occidentalol II isolated from roots and their structures determined (*Chem. Pharm. Bull.* 1989, 37, 511).

NEW COMPOUNDS



Occidentalol I

R = Me

Occidentalol II

R = H

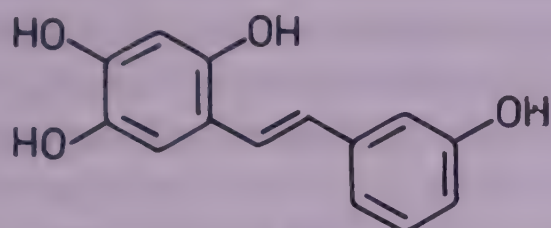
C. pumila Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 144).

Tetratriacontanol, dihydroxanthyletin and physcion isolated (*J. Indian Chem. Soc.* 1989, 66, 66).

C. roxburghii DC. syn. *C. marginata* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 144).

Roxburghinol isolated from leaves and characterised as 1,2-dihydro-1,3,8-trihydroxy-2-methylantraquinone (*Phytochemistry* 1985, 24, 2673); a new stilbene - roxburghin - isolated from wood along with β -sitosterol, chrysophanol and roxburghinol and its structure determined (*J. Indian Chem. Soc.* 1987, 64, 559).

NEW COMPOUNDS



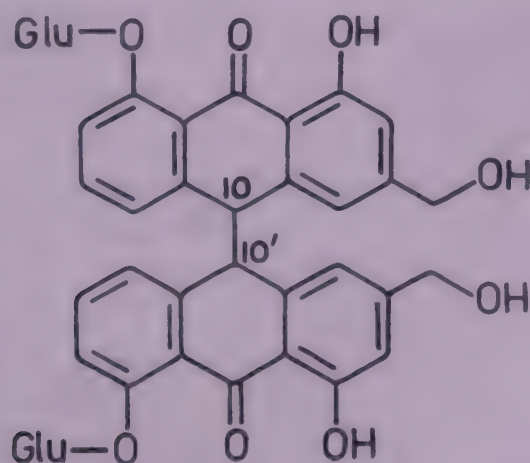
Roxburghin

C. senna L. var. *senna* syn. *C. angustifolia* Vahl (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 144).

Pod extract showed laxative effect in normal and essential fatty acid-deficient rats. Oral administration of pod extract produced dose-dependent increase in number of soft faeces excreted by normal rats. At 30.0 mg/kg dose it reversed net absorption of water and increased prostaglandin production in colonic lumen of normal rats by about four times (*J. Pharm. Pharmacol.* 1988, 40, 882).

Two isomeric aloe-emodin dianthrone diglucosides (I) isolated from leaves and their stereostructures at 10-10' positions elucidated as trans and meso respectively (*J. Pharm. Pharmacol.* 1985, 37, 703); water-soluble galactomannan composed of galactose and mannose in 3:2 ratio, isolated from seeds and partially characterised (*Planta Med.* 1986, 52, 308).

NEW COMPOUNDS



I

BIOLOGICAL ACTIVITY

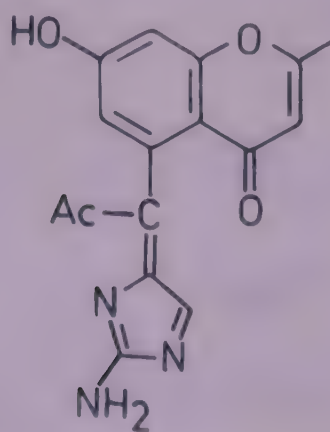
Addition of 15% of trans isomer of aloe-emodin dianthrone diglucoside to sennoside A potentiated purgative activity of latter 1-3 times in mice (*J. Pharm. Pharmacol.* 1985, 37, 703); oral administration of sennosides (20.0-30.0 mg/kg) to fasted dogs induced strong and long-lasting inhibition of myoelectrical colon activity after 6-10 hr. When sennosides were given 1 hr before meal, postprandial increase in colon motility not observed (*Pharmacology* 1988, 36, 23; *Chem. Abstr.* 1988, 108, 68141 a); rhein, emodin and aloe-emodin (40.0 mg/kg, i.p. for 7 days) markedly increased survival time (61.0, 47.0 and 56.0% respectively) of mice with P-388 leukaemia; biosynthesis of DNA, RNA and protein inhibited with increase in concentration of drugs. IC₅₀ values of rhein, emodin and aloe-emodin on TdR incorporation were 65.0, 55.0 and 79.0 µg/ml, on (3H)Urd incorporation 46.0, 50.0 and 80.0 µg/ml and on (3H)Leu incorporation 58.0, 75.0 and 88.0 µg/ml respectively. Rhein and emodin had greater antitumor activity than aloe-emodin (*Zhongguo Yaoke Daxue Xuebao* 1989, 20, 155; *Chem. Abstr.* 1989, 111, 126567 u); in addition, they showed immunosuppressive effect in mice, while rhein and emodin at 100.0 µg/ml inhibited DNA and RNA formation (*Zhongguo Yaoke Daxue Xuebao* 1989, 20, 223; *Chem. Abstr.* 1989, 111, 224957 r).

C. sericea Swartz; see *C. uniflora* Mill.

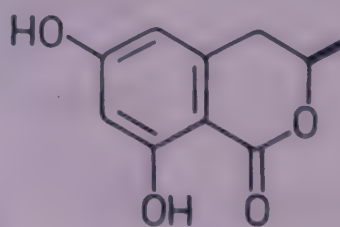
C. siamea Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 145).

New chromone alkaloid - cassiadinine - and a dihydroisocoumarin isomer - (+)6-hydroxymellein - isolated from flowers along with cycloart-23-en-3β,25-diol, friedelin, betulin, 5-acetonyl-7-hydroxy-2-methylchromone and γ-sitosterol and characterised (*Phytochemistry* 1986, 25, 1727); estimation of linoleic (42.7), palmitic (19.0), vernolic (14.0), oleic (11.6), stearic (7.6), sterculic (3.1) and malvalic (2.0%) acids in oil (*J. Am. Oil Chemists Soc.* 1988, 65, 952; *Chem. Abstr.* 1988, 109, 51760 z).

NEW COMPOUNDS



Cassiadinine



6-Hydroxymellein

C. sophera L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 145).

Two new anthraquinones - 1,8-dihydroxy-3,6-dimethoxy-2-methyl-7-vinyanthraquinone and 1,3-dihydroxy-5,7,8-trimethoxy-2-methylanthraquinone - isolated from root bark and characterised (*Phytochemistry* 1984, 23, 2689); isolation and structure determination of 1,8-dihydroxy-2-methylanthraquinone-3-neohesperidoside; sitosterol, chrysophanol and physcion also isolated (*Phytochemistry* 1985, 24, 3073).

C. spectabilis DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 155).

Tetratriacontanyl palmitate, tetratriacontanyl nonadecanoate and 5-acetonyl-7-hydroxy-6-glucosyl-2-methylchromone-2''-O-glucoside isolated from seeds (*Z. Naturforsch.* 1984, 39B, 1425; *Chem. Abstr.* 1985, 102, 59299 g); 4'-hydroxy-7,3'-dimethoxyflavone-5-O- β -D-glucoside isolated from seeds (*J. Indian Chem. Soc.* 1985, 62, 169).

C. timoriensis DC.

Eng. - Limestone cassia; Lushai - Luahmur.

Barakol isolated from leaves (*J. Sci. Soc. Thailand* 1984, 10, 189; *Chem. Abstr.* 1985, 102, 92993 b).

Distribution : West Bengal, Mizoram, Tripura and south India, ascending to 900 m in hills.

C. tora L.; see *C. obtusifolia* L.

C. uniflora Mill. syn. *C. sericea* Swartz

Two galactomannans isolated from seeds and partially characterised (*Carbohydr. Res.* 1988, 182, 119; *Chem. Abstr.* 1988, 109, 226745 c).

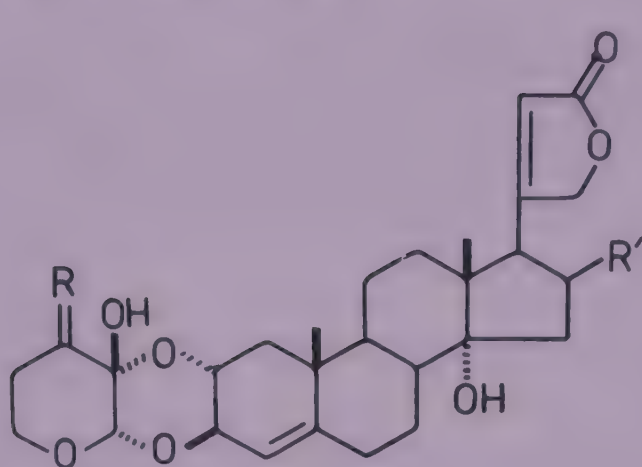
Distribution : Native of tropical America, introduced into India, now running wild in Karnataka and Maharashtra.

CASSINE (Celastraceae)

C. glauca (Rottb.) Kuntze syn. *Elaeodendron glaucum* (Rottb.) Pers. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 146).

Six cardiac glycosides - elaeodendrosides B, C, F, G, K and L - isolated from seeds and their structures elucidated (*Phytochemistry* 1985, 24, 1345).

NEW COMPOUNDS



Elaeodendroside B

R = α -OMe, β -H, R' = H

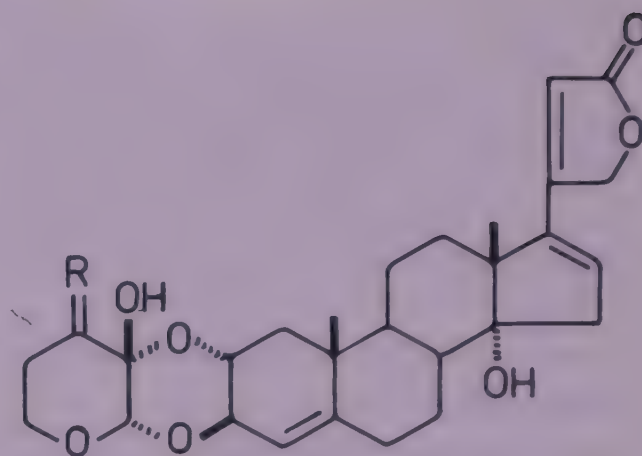
Elaeodendroside C

R = α -H, β -OMe, R' = H

Elaeodendroside F

R = α -OMe, β -H, R' = OAc

Elaeodendroside G

R = α -H, β -OMe, R' = OAc

Elaeodendroside K

R = α -OMe, β -H

Elaeodendroside L

R = β -OMe, α -H

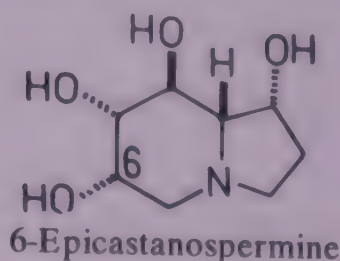
Note : Trivial name elaeodendroside B has been assigned to two different compounds (*Dic. Nat. Products*, Ed: J. Buckingham, Chapman & Hall, London, Vol. 2, 1994, p. 1998, 1999).

CASTANOSPERMUM (Papilionaceae)

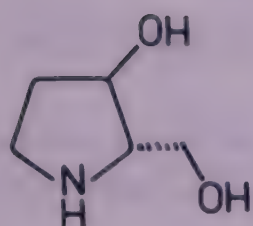
C. australe A.Cunn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 148).

A new pyrrolidine derivative - (2R,3S)2-hydroxymethyl-3-hydroxypyrrolidine (I) - isolated and its structure determined by X-ray studies (*Chem. Commun.* 1985, 738); 6-epicastanospermine isolated from seeds of Australian plant and characterised (*Arch. Biochem. Biophys.* 1986, 251, 450; *Chem. Abstr.* 1987, 106, 116473 t; *J. Nat. Prod.* 1988, 51, 1198); 3,8-diepialexine isolated and its crystal structure determined (*Tetrahedron* 1988, 44, 5959); isolation of australine from seeds along with fagomine and castanospermine and its structure determination (*J. Nat. Prod.* 1988, 51, 1198); 6-epicastanospermine synthesised (*Tetrahedron Lett.* 1988, 29, 3603); synthesis of castanospermine (*Tetrahedron Lett.* 1989, 30, 705).

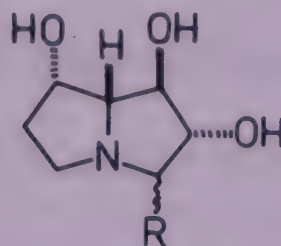
NEW COMPOUNDS



6-Epicastanospermine



I



3,8-Diepialexine

R = α -CH₂OH

Australine

R = β -CH₂OH

BIOLOGICAL ACTIVITY

6-Epicastanospermine was strong inhibitor of amyloglucosidase, weak inhibitor of β -galactosidase and did not inhibit β -glucosidase and α -mannosidase (*Arch. Biochem. Biophys.* 1986, 251, 450; *Chem. Abstr.* 1987, 106, 116473 t); australine shown to be potent and specific inhibitor of amyloglucosidase (*J. Nat. Prod.* 1988, 51, 1198).

CASUARINA (Casuarinaceae)

C. equisetifolia L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 158).

Tryptophan, leucine, valine and glycine isolated from leaves (*Acta Cienc. Indica, Chem.* 1984, 10, 10; *Chem. Abstr.* 1985, 103, 102043 d); gallic acid, protocatechuic acid, hydroquinone, juglanin, afzelin, (+)catechin, (+)gallocatechin, (-)epicatechin-3-gallate and (-)epigallocatechin-3-gallate isolated from fruits; whereas gallic acid methyl gallate, (+)catechin, (-)epicatechin, (+)gallocatechin and (-)epigallocatechin isolated from wood (*Leather Sci.* 1985, 32, 38; *Chem. Abstr.* 1985, 103, 102023 x); isolation of ellagic acid, β -sitosterol and kaempferol-3-O- β -D-galactoside from fruits (*Fitoterapia* 1986, 57, 120); 24-ethylcholest-5-en-3 β -ol (80.5), 24-ethylcholest-5,22-dien-3 β -ol (10.2), 24-methylcholest-5-en-3 β -ol (8.8) and cholesterol (0.5%) isolated from leaves (*Acta Cienc. Indica, Chem.* 1986, 12, 20; *Chem. Abstr.* 1987, 107, 151196 x); isolation of lupeol, taraxerol, germanicol, β -sitosterol, stigmasterol, campesterol and cholesterol from bark (*Bangladesh J. Sci. Ind. Res.* 1987, 22, 68; *Chem. Abstr.* 1989, 110, 63568 b).

BIOLOGICAL ACTIVITY

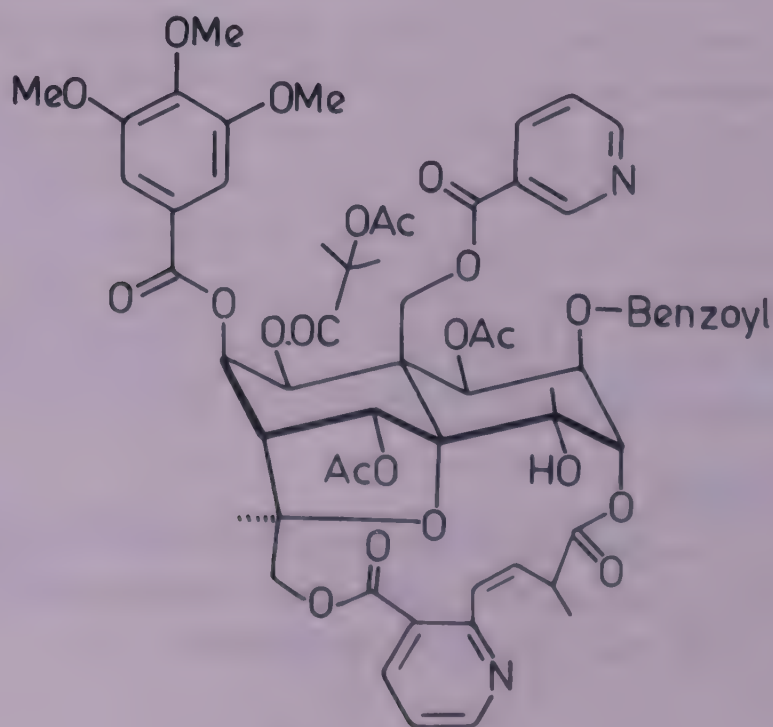
24-Methylcholest-5-en-3 β -ol, 24-ethylcholest-5,22-dien-3 β -ol, 24-ethylcholest-5-en-3 β -ol and cholesterol showed antibacterial activity against *Staphylococcus aureus* (*Acta Cienc. Indica, Chem.* 1986, 12, 20; *Chem. Abstr.* 1987, 107, 151196 x).

CATHA (Celastraceae)

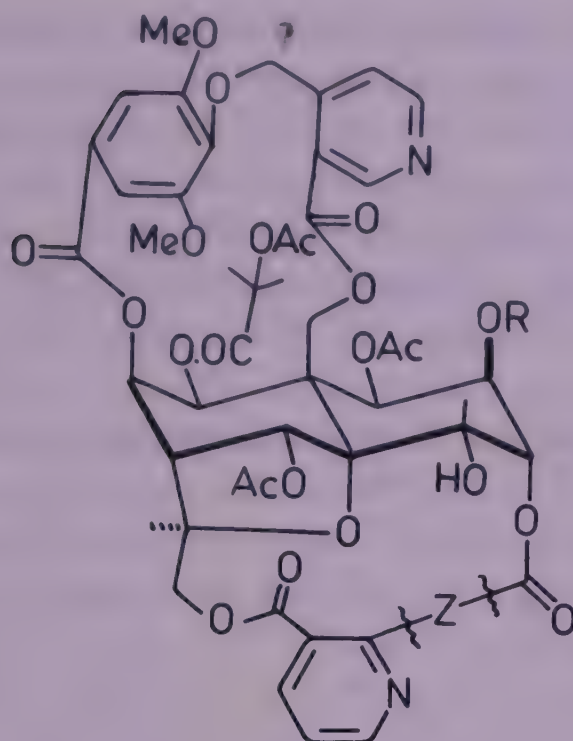
C. edulis Forsk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 148).

Flavonoid fraction at oral dose of 200.0 mg/kg showed significant anti-inflammatory activity against carrageenin-induced paw oedema and cotton pellet granuloma in rats (*Agents Actions* 1985, 17, 379; *Chem. Abstr.* 1986, 104, 81722 c).

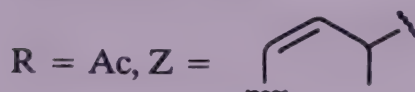
Merucathine isolated from khatamine fraction of plant extract and characterised as 4(S)-amino-3(S)-hydroxy-1-phenyl-trans-pentene by HPLC and GC-MS (*Planta Med.* 1984, 50, 531); (-)-N-formylnorephedrine isolated in cisoid (major) and transoid (minor) forms (*Phytochemistry* 1986, 25, 2241); three new sesquiterpene alkaloids - cathedulins K17, K19 and K20 - isolated from seeds and leaves and their structures determined (*J. Chem. Soc. Perkin 1* 1986, 531); myricetin-3-O- β -D-galactoside and -3-O-rhamnoside, dihydromyricetin-3-O-rhamnoside and quercetin-3-O- β -D-galactoside isolated from aerial parts (*J. Nat. Prod.* 1986, 49, 172); merucathionone, pseudomerucathine and merucathine isolated as their acetyl derivatives (*J. Nat. Prod.* 1987, 50, 1188); acetaldehyde, benzaldehyde, propanal, pentanal, hexanal, heptanal, trans-2-hexenal, acetone, 2-butanone, 3-methylcyclopentanone, methyl alcohol, butan-2-ol, 2-methylpropyl alcohol, methyl acetate, ethyl acetate, hexyl acetate, 1,4-dioxane, ethyl and furfurylmercaptans, cis-3-hexenyl acetate, 1-phenyl-1,2-propanedione and diphenyl ether identified by MS in essential oil of fresh leaves which were incubated in dark for several days (*Dokl. Akad. Nauk Az. SSR* 1988, 44, 53; *Chem. Abstr.* 1989, 110, 228641 k).

NEW COMPOUNDS

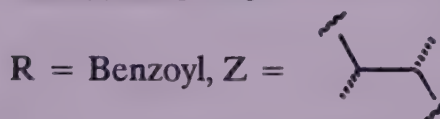
Catheduline K17



Catheduline K19



Catheduline K20



BIOLOGICAL ACTIVITY

Effect of (+)norpseudoephedrine on uteroplacental blood flow studied. Its infusion given to anaesthetised guinea pigs in late pregnancy (62-66 days) after unilateral uterine artery ligation on day 30-32, increased arterial blood pressure by 25.0% and heart rate by 9.0% during infusion. Myoendometrial blood flow was reduced by 31.0% and placental vascular resistance (PVR) increased by 56.0% in the control horn (17 foetuses) and by 82.0% in ligated horn (17 foetuses). When considering only 13 growth-retarded foetuses increase of PVR by 98.0% and reduction of placental blood flow by 19.0% was observed (*Pharmacology* 1987, 34, 89; *Chem. Abstr.* 1987, 106, 149398 a).

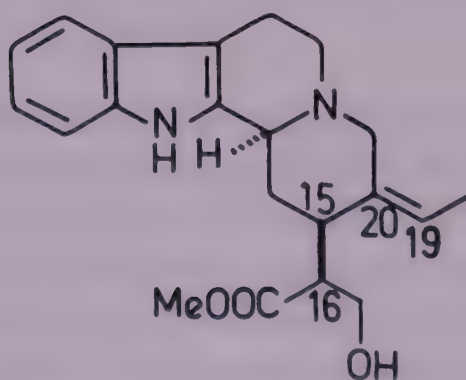
CATHARANTHUS (Apocynaceae)

C. roseus (L.) G.Don syn. *Vinca rosea* L., *Lochnera rosea* (L.) Reichb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 150).

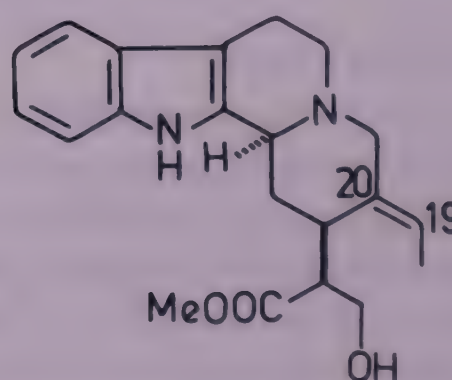
A new indole alkaloid - 21-hydroxycyclolochnerine - isolated from cell suspension culture and its crystal structure determined; two new compounds - 16(R)19,20(E)-isositsirikine and 16(R)19,20(Z)-isositsirikine - also isolated (*Planta Med.* 1984, 50, 242); isolation and structure

determination of rosicine; 14,15-dehydroepivincadine and 19-hydroxytabersonine isolated (*Tetrahedron Lett.* 1984, 25, 6051); a new alkaloid - N-deformylvincristine - isolated and its structure elucidated (*Planta Med.* 1984, 50, 274); new pseudoindoxyl alkaloid - rosamine - isolated from leaves and characterised (*Z. Naturforsch.* 1984, 39B, 1292; *Chem. Abstr.* 1985, 102, 42843 g); vindoline synthesised (*J. Org. Chem.* 1985, 50, 961; *J. Am. Chem. Soc.* 1987, 109, 1603; *Heterocycles* 1989, 28, 43); synthesis of vindorosine (*J. Org. Chem.* 1985, 50, 961); isolation of β -carboline from leaves (*Planta Med.* 1985, 51, 287); cathovaline from leaves (*Planta Med.* 1985, 51, 447); total synthesis of catharanthine (*J. Org. Chem.* 1985, 50, 3236; *J. Am. Chem. Soc.* 1987, 109, 442); ¹³C-NMR and MS studies of catharine (*Z. Naturforsch.* 1985, 40B, 543; *Chem. Abstr.* 1985, 103, 22827 x); ¹³C-NMR spectra of gomaline and rosamine (*Fitoterapia* 1986, 57, 438); new dihydroindole alkaloid - bannucine - isolated from leaves and its structure established (*J. Chem. Soc. Perkin 1* 1986, 923); improved method for isolation of catharanthine and vindoline (*Rev. Cubana Farm.* 1986, 20, 181; *Chem. Abstr.* 1987, 106, 201587 c); synthesis of vincamine (Ger. 3,606,665 (1986) Sep. 04; *Chem. Abstr.* 1987, 106, 18917 w; *J. Org. Chem.* 1987, 52, 353); determination of ricinoleic acid (3.27%) in seed oil by GLC (*J. Oil Technol. Assoc. India* 1987, 19, 63; *Chem. Abstr.* 1988, 109, 226754 e); isolation of new binary alkaloid - leurosinone - from leaves and its structure determination (*J. Chem. Soc. Perkin 1* 1988, 2175); extraction of 3',4'-anhydrovinblastine (0.23%) from leaves (*Phytochemistry* 1988, 27, 1713); regioselective synthesis of vinblastine and leurosine (*Heterocycles* 1988, 27, 1845).

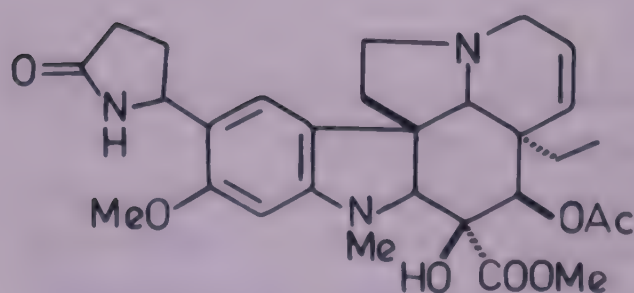
NEW COMPOUNDS



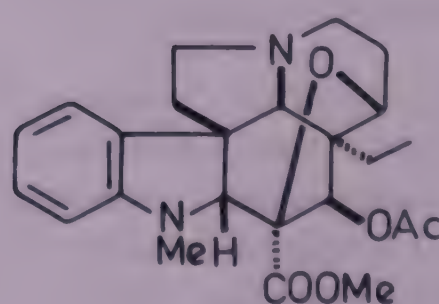
16(R)19,20(Z)-Isositsirikine



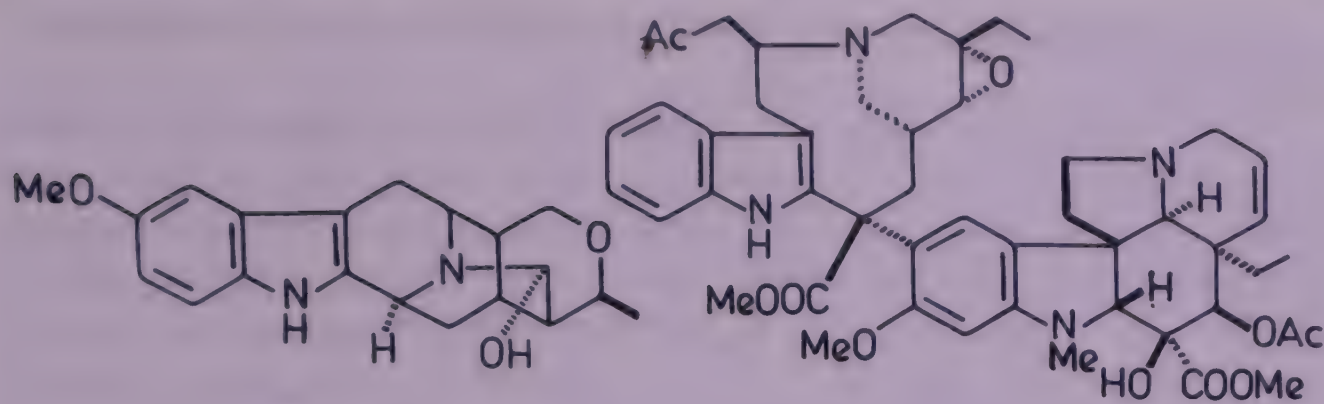
16(R)19,20(E)-Isositsirikine



Bannucine

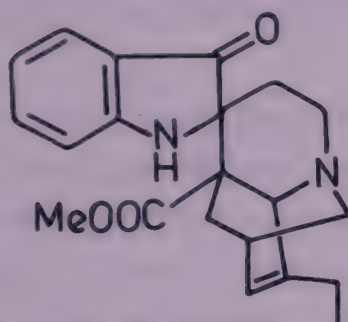


Cathovaline

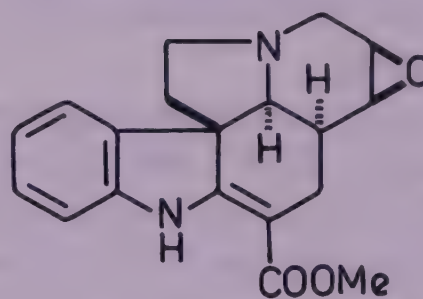


21-Hydroxycyclolochnerin

Leurosinone



Rosamine



Rosicine

BIOLOGICAL ACTIVITY

Possible interaction of antitumor agents vincristine and VP-16-213 investigated in mice bearing P-388 murine leukaemia cells. Long-term survival was observed in mice administered with vincristine, VP-16-213 and combination of vincristine and VP-16-213; similar trend was observed in mice bearing P-1534 murine leukaemia (*Cancer Chemother. Pharmacol.* 1984, 13, 176; *Chem. Abstr.* 1985, 102, 278 m); concentration-dependent increase in frequency of sister chromatid exchanges was observed after treatment of human lymphocyte culture with vincristine (1.25-5.0 $\mu\text{g/ml}$) (*Cell Chromosome Res.* 1984, 7, 49; *Chem. Abstr.* 1985, 103, 81358 t); vincristine and vinblastine interrupted cell division at metaphase, anaphase or telophase stages; vindesine did not inhibit cell division but induced abnormal mitosis which resulted in death of tumor cells (*Saishin Igaku* 1985, 40, 2617; *Chem. Abstr.* 1986, 104, 199722 f); comparative cytotoxicity and uptake of vincristine, vinblastine and vindesine evaluated in murine lymphoblastine leukaemia (L-5178); vincristine was most active (IC_{50} , 5.8 nM) while activities of vinblastine and vindesine were almost similar (IC_{50} , 44.0 nM and 35.0 nM respectively) (*Brit. J. Pharmacol.* 1988, 93, 902).

Study of morphometric effects of administration of vincristine (200.0, 100.0 or 50.0 $\mu\text{g/kg/wk}$) for six months on nerve regeneration in rat sciatic nerve after crush injury showed dose-dependent reduction in nerve fibre size (*J. Neurol. Sci.* 1985, 71, 165; *Chem. Abstr.* 1986, 104, 81671 k); intracerebroventricular injection of vincristine sulphate (0.5 mg) in adult male

rats caused within 11 days impairment of motor and reflexive behaviour (*Eur. J. Pharmacol.* 1989, 162, 43).

Following injection of vincristine (0.1 mg/kg, i.v.) into rats, no changes occurred for 30-40 hr in extracellular photosignal (receptor potential) of isolated retina; thereafter signal decreased drastically, some areas of retina surface being more affected than others, maximum fall of potential occurred at 50 hr followed by regeneration (*Fortschr. Ophthalmol.* 1986, 82, 604; *Chem. Abstr.* 1986, 104, 102116 a); vincristine-induced changes studied in isolated perfused cat eye; early rapid fall in C-wave, a⁻potential that arises largely in pigment epithelium, was observed. Ultrastructurally, principal changes in cytoarchitecture were seen in retinal photoreceptors; these suggest that drug interferes with functional integrity of transport system which maintains synaptic activity (*Exp. Eye Res.* 1989, 48, 771; *Chem. Abstr.* 1989, 111, 70437 g).

Vincristine increased urinary Mg²⁺ excretion in healthy rats (*Magnesium Bull.* 1987, 9, 40; *Chem. Abstr.* 1987, 107, 108915 u); whereas decreased liver alkaline phosphatase and ATPase activities in mice probably due to cytotoxic effect on liver (*Hanyang Uidae Haksulchi* 1987, 7, 921; *Chem. Abstr.* 1988, 108, 179694 c); changes in intestinal myoelectric activity after administration of vincristine (0.50 mg/kg) in unanaesthetised rats studied over a period of 2 hr. Action potential activity increased markedly 45 min after administration accompanied by disruptions of migrating myoelectric complex. Changes in intestinal transit were correlated with alterations in myoelectric activity (*Gastroenterology* 1987, 92, 472; *Chem. Abstr.* 1987, 106, 113257 q).

Vinblastine (i.p. or i.v.) inhibited growth of sarcoma 45 in rats; inhibition was enhanced by simultaneous administration of heparin which causes hyperfunctioning of anticoagulating system (*Eksp. Onkol.* 1984, 6, 69; *Chem. Abstr.* 1985, 102, 55762 e); vincamine in low concentration induced sustained contraction of isolated guinea pig trachealis with long latency and slow onset, whereas in high concentration it induced relaxation which was potentiated in precontracted trachealis (*Eur. J. Pharmacol.* 1989, 162, 387); raubasine (i.v.) increased regional blood flow in heart, renal cortex and medulla, spleen, liver, skeletal muscle and skin in gallamine-immobilised cats (*Yakuri to Chiryo* 1986, 14, 5577; *Chem. Abstr.* 1987, 106, 27605 v).

CAUCALIS (Apiaceae)

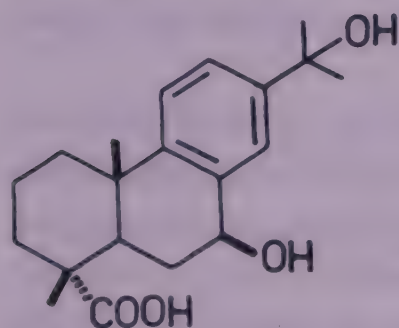
C. anthriscus (L.) Clarke; see *Torilis japonica* (Houtt.) DC.

CEDRUS (Pinaceae)

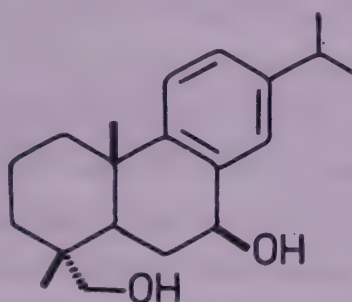
C. deodara (Roxb. ex D.Don) G.Don syn. *C. libani* Barrel var. *deodara* (Roxb. ex D.Don) Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 156).

Stereoselective synthesis of longiborneol (*Chem. Commun.* 1986, 1691); identification of α -pinene in leaf oil (*Biochem. Syst. Ecol.* 1986, 14, 469; *Chem. Abstr.* 1987, 106, 89930 f); isolation of 7β ,15-dihydroxydehydroabietic acid and 7-caffeoyloxy-hexadecan-1,16-diol from pollen grains and their structure determination; in addition dehydroabietic acid, 15-hydroxydehydroabietic acid, 7α ,18-dihydroxydehydroabietanol, naringenin and β -sitosterol- β -D-glucoside isolated (*Chem. Pharm. Bull.* 1987, 35, 229); 7β ,18-dihydroxydehydroabietanol, 15-methoxyabietic acid and 9-caffeoyloxyhexadecanol isolated from pollens along with 7β -hydroxydehydroabietic acid and 15-hydroxyabietic acid; structures of new compounds elucidated (*Chem. Pharm. Bull.* 1987, 35, 2443); isolation of ethyl 23-methylpentacosanoate from stem bark and its structure determination (*J. Chem. Soc. Pak.* 1988, 10, 63; *Chem. Abstr.* 1989, 110, 4636 z).

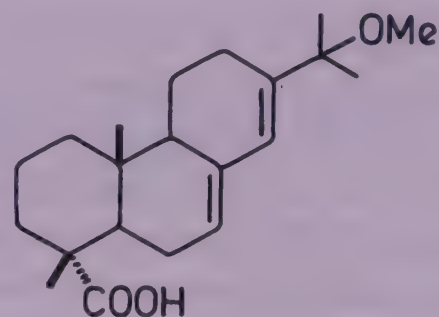
NEW COMPOUNDS



7β ,15-Dihydroxydehydroabietic acid



7β ,18-Dihydroxydehydroabietanol



15-Methoxyabietic acid

C. libani Barrel var. *deodara* (Roxb. ex D.Don) Hook.f.; see *C. deodara* (Roxb. ex D.Don) G.Don

CEIBA (Bombacaceae)

C. pentandra (L.) Gaertn. syn. *Eriodendron anfractuosum* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 56).

A water-soluble polysaccharide, consisting of rhamnose, xylose, arabinose, glucose, galactose, glucuronic acid and galacturonic acid isolated from bark and partially characterised (*Carbohydr. Res.* 1989, 191, 321; *Chem. Abstr.* 1989, 111, 130768 c); alkali-soluble xylans, composed of fucose, xylose, arabinose, glucose, galactose, glucuronic acid and 4-methoxyglucuronic acid isolated from bark and characterised (*Carbohydr. Res.* 1989, 191, 333; *Chem. Abstr.* 1989, 111, 112315 y).

Note : Var. *indica* from title plant deleted because it is an exotic tree introduced into India and so far this var. level is not mentioned in any recent literature (*Flora of Tamil Nadu*, Vol. 1, 1983, 38 and WI, 1992).

CELASTRUS (Celastraceae)

C. paniculatus Willd. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 167).

Zeylasterone and zeylasteral identified in root bark of Sri Lankan plant (*Stud. Org. Chem.* 1986, 26, 109; *Chem. Abstr.* 1987, 106, 135224 d); seeds contained normal triglycerides (20.2), polar triglycerides (44.4), polar nonglyceridic esters (23.5) and nonpolar nonglyceridic esters (11.0); major acid components in these fractions were: palmitic acid 25.1, 42.0, 12.7, 58.2; stearic acid 6.7, 4.5, 45.8; oleic acid 46.1, 24.8, 4.7, 14.2; linoleic acid 15.4, 14.7, 10.0 and linolenic acid 3.0, 13.1, 43.0% respectively (*Fette Wiss. Technol.* 1987, 89, 119; *Chem. Abstr.* 1987, 106, 219432 h).

CELOSIA (Amaranthaceae)

C. argentia L. var. *cristata* (L.) O. Kuntze syn. *C. cristata* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 157).

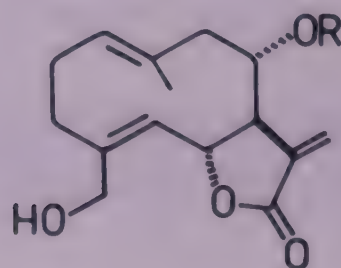
24-Ethyl-22-dehydrolathosterol (69.6), 24-ethylthasterol (17.5), 24-methylthasterol (3.9), 24-methyl-22-dehydrolathosterol (3.8), avenasta-7-en-ol (3.3) and 24-methylenelathosterol (1.9%) determined in seeds by GLC (*Indian J. Chem.* 1986, 25B, 750); hexadecadienoic, tricosanoic, lignoceric, cerotic and α -aminobutyric acids together with 1,1'-[3-(2-cyclopentylethylidene)-1,5-pentanediy]bis-cyclopentane identified in roots by HPLC and GC-MS (*Han'guk Yongyang Siklyong Hakhoechi* 1988, 17, 172; *Chem. Abstr.* 1989, 111, 160060 h).

C. cristata L.; see *C. argentia* L. var. *cristata* (L.) O. Kuntze

CENTAUREA (Asteraceae)

C. calcitrapa L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 168).

Two new lactones (I & II) and two isomeric bisabolene derivatives - 4,9-dioxo-bisabol-2,7(14),10-triene and 4,9-dioxo-bisabol-2,7(E),10-triene - isolated from aerial parts together with cnicin-4'-O-acetate, apotaxene, squalene, phytol, taraxasterol and 5,7-dihydroxy-6,3',4'-trimethoxyflavone (*Planta Med.* 1986, 52, 399).

NEW COMPOUNDS

I

R = H

II

R = COC(=CH₂)CH(OH)CH₂OH

C. cyanus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 158).

Cyanidin-3-(6''-succinylglucosido)-5-glucoside isolated from flowers (*Phytochemistry* 1985, 24, 1121); chlorogenic, neochlorogenic and caffeic acids from flowers (*Khim. Pri. Soedin.* 1986, 107; *Chem. Abstr.* 1986, 105, 3562 g); isolation of new anthocyanin from pink flowers and its characterisation as pelargonidin-3-(6''-succinylglucosido)-5-glucoside (*Phytochemistry* 1988, 27, 1228).

C. melitensis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 158).

(+) Melitensin synthesised (*Tetrahedron* 1984, 40, 5243); salonitenolide, onopordopicrin and arctiopicrin isolated (*Phytochemistry* 1989, 28, 1975).

C. phyllocephala Boiss. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 159).

Hispidulin, nepetin and jaceosidin identified in free and glycosylated forms, and cirsiolol only as aglycone (*Herba Hung.* 1985, 24, 183; *Chem. Abstr.* 1986, 104, 183327 v).

C. picris Pall.; see *Acroptilon repens* (L.) DC.

CENTELLA (Apiaceae)

C. asiatica (L.) Urban syn. *Hydrocotyle asiatica* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 159).

Alcoholic extract produced significant changes in neurochemistry of brain besides showing anticonvulsant and barbiturate hypnosis potentiation effects in rats; it showed varying degree of sedation in mice and no mortality was found at an oral dose of 5.0 g/kg. It reduced amphetotoxicity but did not provide any protection against metrazole-induced or electro-shock seizures; it also produced hypothermia (*J. Res. Ayurveda & Siddha* 1981, 2, 1, 144).

CENTIPEDA (Asteraceae)

C. minima (L.) A.Br. & Aschers. syn. *C. orbicularis* Lour. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 159).

Isolation of lupeol acetate, β -sitosterol, taraxasterol, 10-isobutyryloxy-8,9-epoxythymol, 9,10-diisobutyryloxy-8-hydroxythymol, arnicolide C, brevifolin, helenalin and florilenalin isobutyrate from air-dried plant (*Kexue Tongbao* 1984, 29, 900; *Chem. Abstr.* 1985, 102, 92930 d); 28-O- β -D-xylopyranosides of $1\alpha,3\beta,19\alpha,23$ -tetrahydroxyurs-12-en-28-oic acid, $1\beta,2\alpha,3\beta,19\alpha,23$ -pentahydroxyurs-12-en-28-oic acid, $3\alpha,21\alpha,22\alpha,28$ -tetrahydroxyolean-12-ene and $3\alpha,16\alpha,21\alpha,22\alpha,28$ -pentahydroxyolean-12-ene isolated (*Phytochemistry* 1989, 28, 1197).

C. orbicularis Lour.; see *C. minima* (L.) A.Br. & Aschers.

CENTRANTHERA (Scrophulariaceae)

C. grandiflora Benth.

Isolation of azafrin and mannitol from roots (*Zhongyao Tongbao* 1985, 10, 227; *Chem. Abstr.* 1985, 103, 166001 w).

Distribution : Sikkim and Meghalaya, alt. 300-1500 m.

CEPHAELIS (Rubiaceae)

C. ipecacuanha (Brot.) A.Rich. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 160).

Two new monoterpene glucosides - neoipecoside and 7-methylneoipecoside - isolated and characterised (*Chem. Pharm. Bull.* 1989, 37, 1137).

NEW COMPOUNDS



Neoipecoside

R = H

7-Methylneoipecoside

R = Me

CEPHALANDRA (Cucurbitaceae)

C. indica Naud.; see *Coccinia grandis* (L.) Voigt

CERASUS (Rosaceae)

C. avium Moench; see *Prunus avium* L.

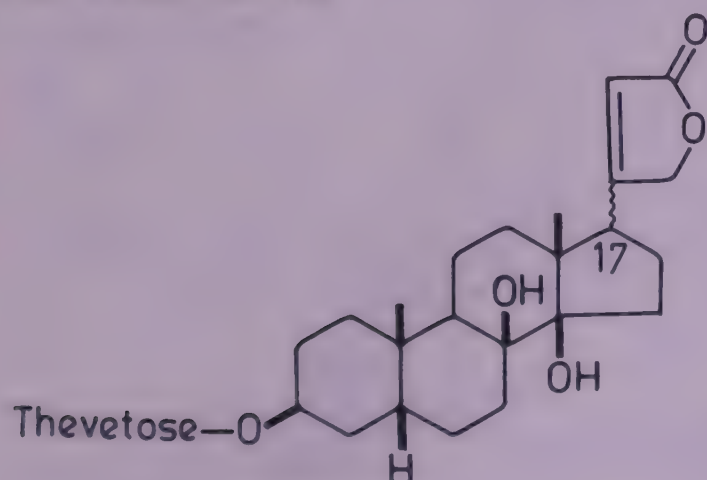
CERBERA (Apocynaceae)

C. manghas L. syn. *C. odollam* Gaertn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 160).

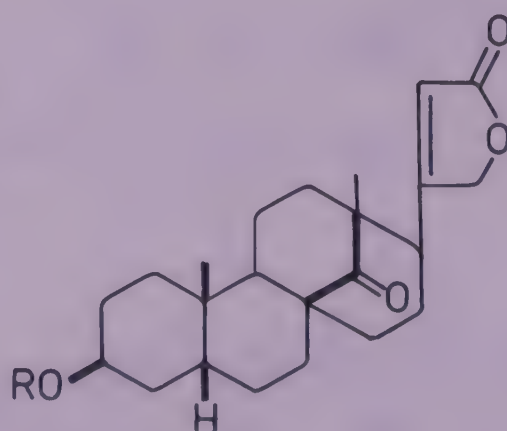
Five new cardenolides - cerleaside A, 17 β -cerdollaside (8 β -hydroxy-17 β -digitoxigenin- α -L-thevetoside) and its isomer 17 α -cerdollaside, 17 α -solanoside (17 α -digitoxigenin- α -L-

acofrioside) and tanghinigenin- α -L-acofrioside - isolated from leaves together with 17β -solanoside (17β -digitoxigenin- α -L-acofrioside) 17α - and 17β -neriifolins, 17α - and 17β -deacetyltanghinigenins (*Chem. Pharm. Bull.* 1987, 35, 2744); air-dried leaves afforded new glycosides - 17α -digitoxigenin- β -D-glucos-3-ulosyl(1 \rightarrow 4)- α -L-thevetoside (I) and 17α -tanghinigenin- β -D-glucos-3-ulosyl(1 \rightarrow 4)- α -L-thevetoside (II) along with 3-O- β -D-glucosyl(1 \rightarrow 4)- α -L-thevetosides of 17α - and 17β -digitoxigenins and 17α - and 17β -tanghinigenins and gentiobiosyl(1 \rightarrow 4)- α -L-thevetosides of 17β -digitoxigenin and 17β -tanghinigenin; whereas fresh leaves yielded two new glycosides - cerleaside B (oleagenin- β -glucosyl(1 \rightarrow 4)- α -L-thevetoside) and 17β -digitoxigenin- β -D-gentiotriosyl(1 \rightarrow 4)- α -L-thevetoside (III) (*Chem. Pharm. Bull.* 1987, 35, 4813); isolation of three new glycosides - 17α -digitoxigenin- β -D-apiosyl(1 \rightarrow 6)- β -D-glucosyl(1 \rightarrow 4)- α -L-thevetoside named as cerapioside, 17α -digitoxigenin- β -cellobiosyl(1 \rightarrow 4)- α -L-thevetoside and 17α -digitoxigenin- β -gentiobiosyl(1 \rightarrow 4)- α -L-thevetoside - from stems along with cerleaside B, thevetin B and 2'-O-acetylthevetin B as well as glucosyl-thevetosides of 17α - and 17β -digitoxigenins and 17α - and 17β -tanghinigenins (*Chem. Pharm. Bull.* 1987, 35, 4993); isolation of (-)olivil and (+)cyclo-olivil from stems (*Phytochemistry* 1988, 27, 3627; *Chem. Pharm. Bull.* 1988, 36, 795); three olivil dimers - 5',5'''-bisolivil (cerberalignan A), 5',5''-bisolivil (cerberalignan B) and 5,5''-bisolivil (cerberalignan C) - isolated from stems; leaves afforded olivil-4-O-glucoside and olivil-4'-O-glucoside (*Chem. Pharm. Bull.* 1988, 36, 795; *Phytochemistry* 1988, 27, 3627); additional cerberalignans D, E, F, G, H and I isolated and characterised (*Phytochemistry* 1988, 27, 3627).

NEW COMPOUNDS



Cerdollaside

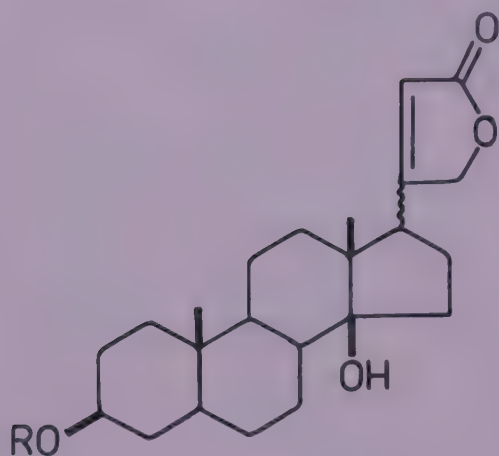
 $\sim = \beta$
 17α -Cerdollaside
 $\sim = \alpha$


Cerleaside A

R = Thevetose

Cerleaside B

R = Thevetose(4 \rightarrow 1)Glu

17 α -Solanoside

~ = α , R = Acofriose

17 β -Solanoside

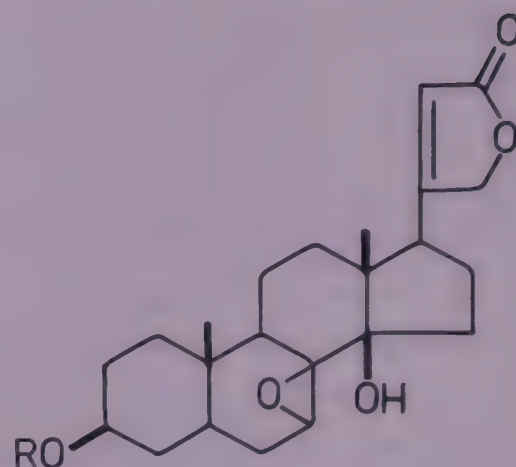
~ = β , R = Acofriose

I

~ = α , R = Thevetose(4 \rightarrow 1)Glucos-3-ulose

III

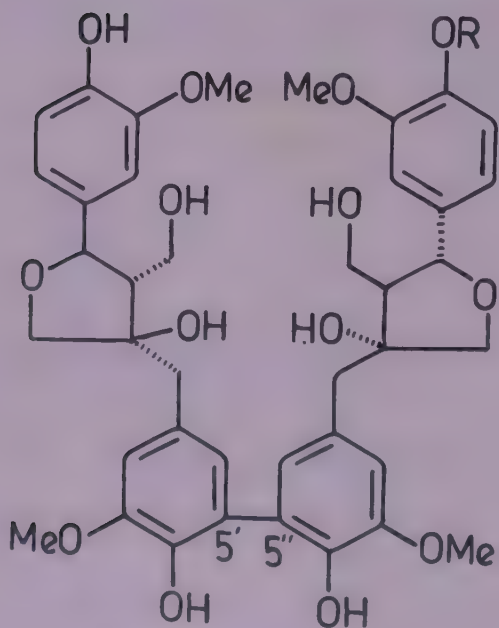
~ = β , R = Thevetose(4 \rightarrow 1)Gentiotriose

Tanghinigenin- α -L-acofrioside

R = Acofriose

II

R = Thevetose(4 \rightarrow 1)Glucos-3-ulose

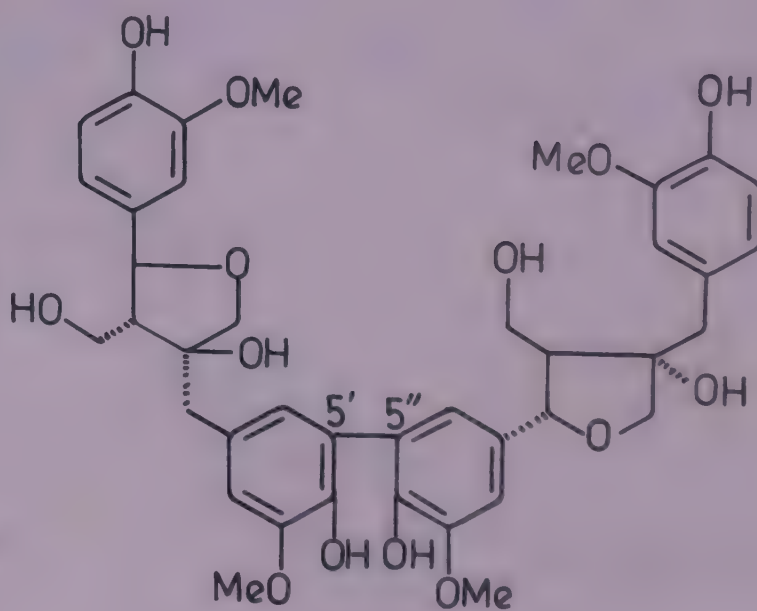


Cerberalignan A

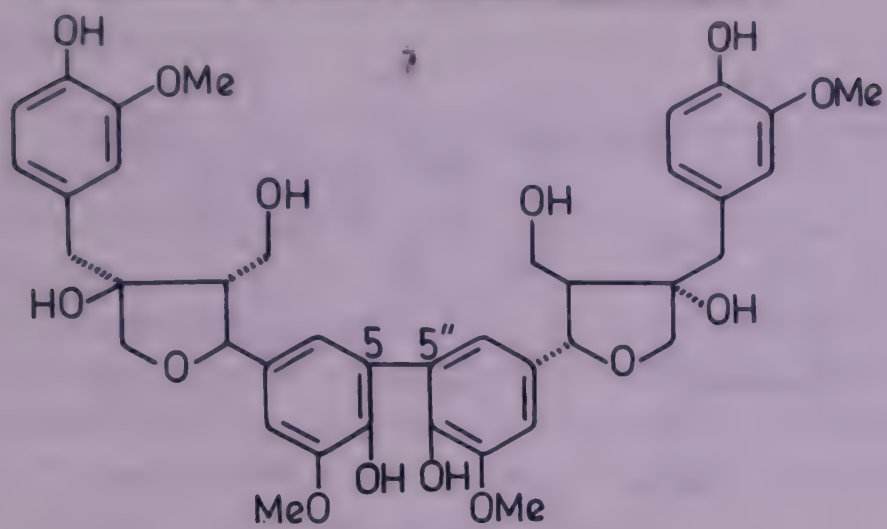
R = H

Cerberalignan H

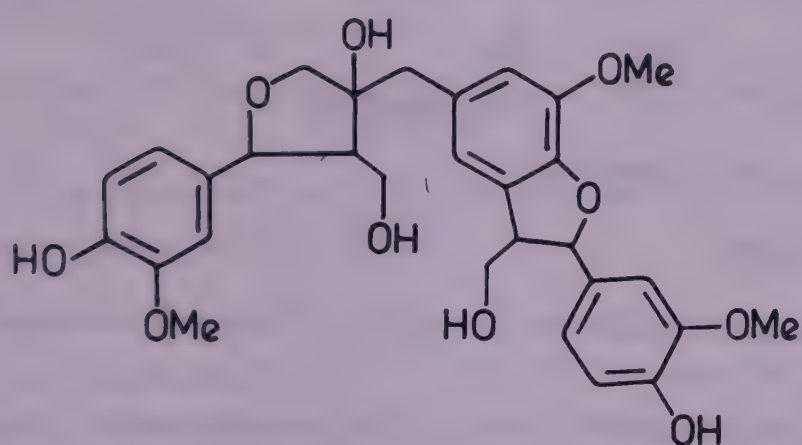
R = Erythro-guaiacyl glycerol



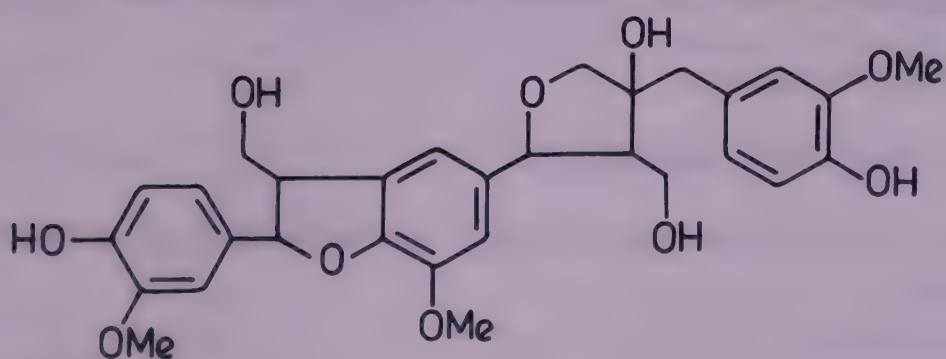
Cerberalignan B



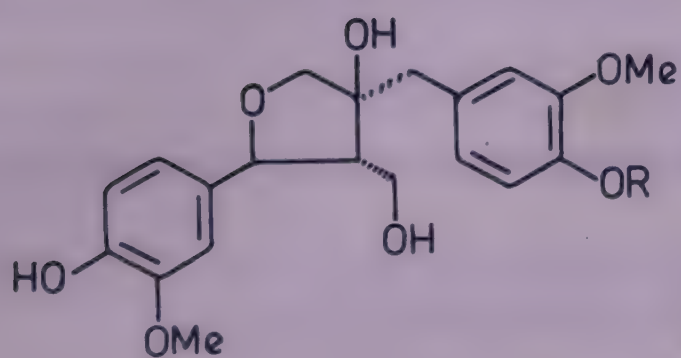
Cerberalignan C



Cerberalignan D



Cerberalignan E

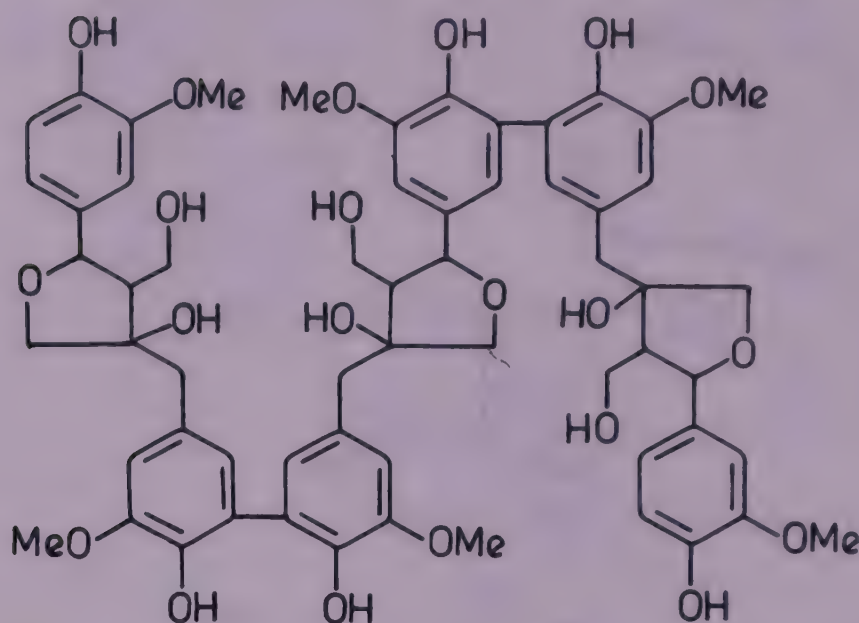


Cerberalignan F

R = Erythro-guaiacyl glycerol

Cerberalignan G

R = Threo-guaiacyl glycerol



Cerberalignan I

C. odollam Gaertn.; see *C. manghas* L.

CESTRUM (Solanaceae)

C. nocturnum L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 98).

Benzaldehyde, benzyl alcohol, benzyl acetate, methyl benzoate, phenyl acetaldehyde, phenylethyl alcohol, linalool and α -farnesene identified as major components in head space volatiles of flowers by GC-MS (*Youji Huaxue* 1988, 8, 357; *Chem. Abstr.* 1988, 109, 208282 v).

CHAEROPHYLLUM (Apiaceae)

C. acuminatum Lindl.; see *C. aromaticum* L.

C. aromaticum L. syn. *C. acuminatum* Lindl., *C. reflexum* Lindl. var. *acuminatum* (Lindl.) Hedge & Lamond.

Ladakh - Neo-cha.

Isolation of apigenin and its 7-O- β -D-glucoside, luteolin-7-O- β -D-glucoside and kaempferol-3-glucoside from aerial parts of blooming plant (*Herba Pol.* 1986, 32, 139; *Chem. Abstr.* 1988, 109, 70419 m).

Distribution : Ladakh and Kashmir to Kumaon, alt. 1500-2700 m.

C. reflexum Lindl. var. *acuminatum* (Lindl.) Hedge & Lamond.; see *C. aromaticum* L.

CHAMAECYPARIS (Cupressaceae)

C. lawsoniana (Murr.) Parl. syn. *Cupressus lawsoniana* Murr. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 98).

Oil exhibited mild activity against *Bacillus subtilis*, *Staphylococcus aureus*, *Aspergillus niger* and *Neisseria* species (*Egypt. J. Pharm. Sci.* 1986, 27, 341; *Chem. Abstr.* 1987, 106, 219350 e).

Amentoflavone, 7-O-methylamentoflavone, 7,4',7'-tri-O-methylamentoflavone, hinokiflavone and quercetin isolated from leaves in addition to quercetin and kaempferol glycosides (*Indian J. Chem.* 1985, 24B, 321); detection of cis-3-hexen-1-ol, car-3-ene, sabinene, limonene, α - and γ -terpinenes, p-menth-1-ene and (E) β -farnesene in oil from young twigs (*Egypt. J. Pharm. Sci.* 1986, 27, 341; *Chem. Abstr.* 1987, 106, 219350 e).

CHEILANTHES (Cheilantheaceae)

C. farinosa (Forsk.) Kaulf. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 173).

Isolation of new flavone and its characterisation as 8C-methyl-5,7-dihydroxy-3',4'-dimethoxyflavone (*J. Indian Chem. Soc.* 1988, 65, 149).

C. fragrans (L.f.) Sw.

A new flavonol triglycoside isolated and characterised as quercetin-3-O-glucosyl(1 \rightarrow 4)-galactosylrhamnoside (*Chem. Ind.* 1985, 799); isolation of myricetin-3-O-glucosido-7-O-galactoside from aerial parts and its structure determination (*Chem. Ind.* 1986, 878); two novel flavonol glycosides - quercetin-3-O-glucosido-7-O-neohesperidoside and quercetin-3-O-galactosido-7-O-neohesperidoside - isolated and their structures determined (*Tetrahedron* 1989, 45, 215).

Distribution : Himalayas, Kashmir and Himachal Pradesh, alt. 600-3500 m.

CHENOPODIUM (Chenopodiaceae)

C. quinoa Willd.

Eng. - Quinoa.

Five new saponins isolated from brans and characterised as hederagenin-3-O- β -glucopyranosyl(1 \rightarrow 3)- α -arabinopyranoside-28-O- β -glucopyranosyl ester, hederagenin-3-O- β -glucopyranosyl(1 \rightarrow 3)- β -galactopyranoside-28-O- β -glucopyranosyl ester and 3-O-arabinopyranoside, 3-O-glucopyranosyl(1 \rightarrow 3)- α -arabinopyranoside and 3-O-glucopyranosyl(1 \rightarrow 3)- β -galactopyranoside of phytolaccagenic acid-28-O- β -glucopyranosyl ester (*Chem. Pharm. Bull.* 1988, 36, 1415).

Distribution : Native of Peru, introduced into India at Shimla (Himachal Pradesh) and Indian Agricultural Research Institute, New Delhi.

C. cumingianus (C.DC.) Harms ssp. *balansae* (C.DC.) Mabberley syn. *C. paniculatus* (Roxb.) Hiern. (nom. illeg.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 164).

Isolation of 6 α -acetoxyazadirone, 6 α -acetoxygedunin, 6 α -acetoxyepoxyazadirone and 17 β -hydroxy-6 α -acetoxyazadiradione from seeds (*Indian J. Chem.* 1989, 28B, 231).

C. paniculatus (Roxb.) Hiern.; see *C. cumingianus* (C.DC.) Harms ssp. *balansae* (C.DC.) Mabberley

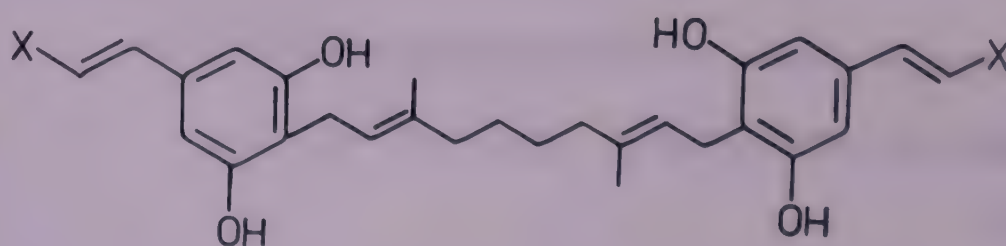
C. brachystachys Blume; see *Sarcandra glabra* (Thunb.) Nakai

C. glaber Makino; see *Sarcandra glabra* (Thunb.) Nakai

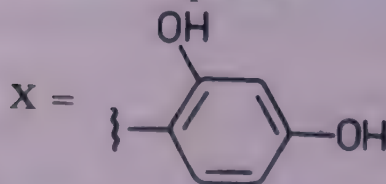
C. excelsa Benth. & Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 61).

Isolation of a new stilbene - 4-geranyl-3,5,4'-trihydroxy-trans-stilbene - from wood and its characterisation (*Phytochemistry* 1988, 27, 3014; *ibid.* 1989, 28, 917); a stilbene dimer - excelsaocetaphenol - isolated from wood along with chlorophorin, hydroxyresveratrol and albufuran B; structure of excelsaocetaphenol elucidated (*Phytochemistry* 1989, 28, 917).

NEW COMPOUNDS



Excelsa octaphenol



C. axillaris (Roxb.) Burtt & Hill syn. *Spondias axillaris* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 166).

New flavonol glycoside - kaempferol-5-O-arabinoside - isolated from leaves; quercetin and its 3-O-rhamnoside, myricetin, its 3-O-rhamnoside and kaempferol also isolated (*Indian J. Chem.* 1987, 26B, 85); fruits afforded quercetin, naringenin, kaempferol-7-O-glucoside, salicylic acid, β -sitosterol and daucosterol (*Zhongcaoyao* 1989, 20, 104; *Chem. Abstr.* 1989, 110, 199012 y).

CHROMOLAENA (Asteraceae)

C. odorata (L.) King & Robinson; see *Eupatorium odoratum* L.

CHROZOPHORA (Euphorbiaceae)

C. plicata (Vahl) A.Juss. ex Spreng. syn. *C. prostrata* Dalz. & Gibs., *C. rottleri* (Geisel.) A. Juss. ex Spreng. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 62).

Three new glycosides - 3,5,6,7,8-pentamethoxyxanthone-1-O-rhamnosyl(1 \rightarrow 6)-glucopyranoside, 3,5,8-trimethoxyxanthone-1-O-glucopyranoside and 2-acetonyl-5-methyl-7-hydroxy-6C-glucopyranosyl-chromone-2''-O-glucopyranoside - isolated from roots and their structures determined (*Phytochemistry* 1988, 27, 3692).

C. prostrata Dalz. & Gibs.; see *C. plicata* (Vahl) A.Juss. ex Spreng.

C. rottleri (Geisel.) A.Juss. ex Spreng.; see *C. plicata* (Vahl) A.Juss. ex Spreng.

CHRYSANTHEMUM (Asteraceae)

C. balsamita L.

Eng. - Alecost, Costmary, Mint geranium.

Essential oil exhibited insecticidal activity.

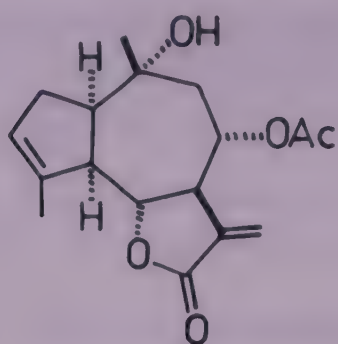
Pyrethrin I isolated from leaves (*Z. Naturforsch.* 1986, 41C, 725; *Chem. Abstr.* 1986, 105, 130712 f).

Distribution : Introduced into India and grown as ornamental in Assam, Arunachal Pradesh, Tripura and Meghalaya.

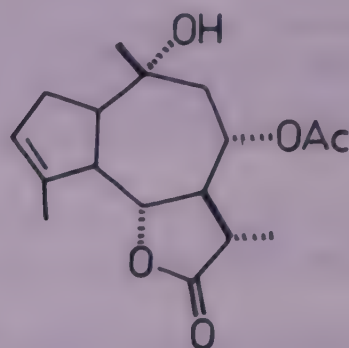
C. coronarium L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 167).

Two sesquiterpene lactones - cumambrin A and dihydrocumambrin A - isolated from flower heads and their structures determined (*Phytochemistry* 1984, 23, 2953).

NEW COMPOUNDS



Cumambrin A

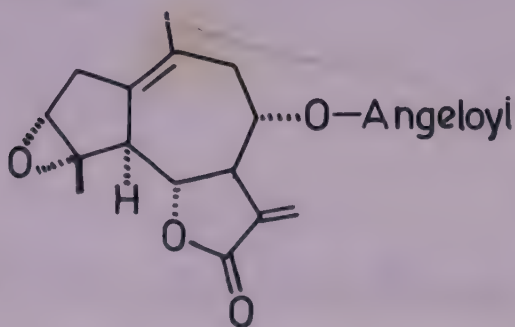


Dihydrocumambrin A

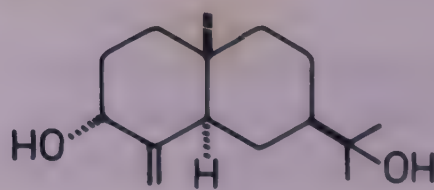
C. indicum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 167).

A new guaianolide - angeloylajadin - isolated from aerial parts together with angeloyl-cumambrin B and arteglinin A and its structure elucidated (*Planta Med.* 1985, 51, 284); chrysanthemol isolated from flowers and characterised; acacetin, cumambrin A, daucosterol, glycerol-1-monobehenate and palmitic acid also isolated (*Yaoxue Xuebao* 1987, 22, 837; *Chem. Abstr.* 1988, 108, 164702 e); isolation of new bisabolane ketodiols - indicumenone - and its structure elucidation (*Planta Med.* 1987, 53, 118); structure of yejuhua lactone, previously isolated from flowers and partially characterised, now shown to be a diguaianolide identical with handelin (*Yaoxue Xuebao* 1987, 22, 67; *Chem. Abstr.* 1987, 106, 135326 p).

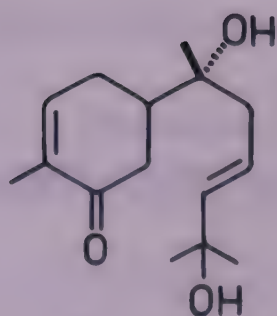
NEW COMPOUNDS



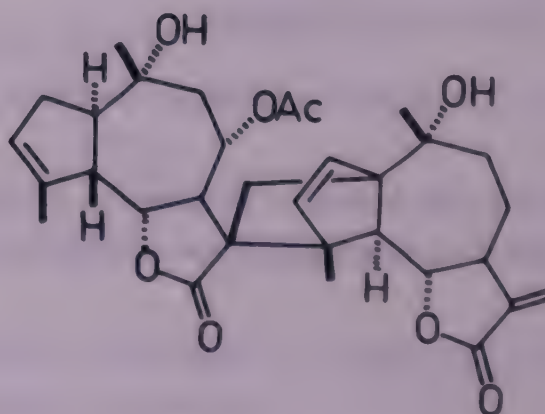
Angeloylajadin



Chrysanthemol



Indicumenone



Yejuhua lactone

BIOLOGICAL ACTIVITY

Chrysanthemol exhibited strong anti-inflammatory activity in mice (*Yaoxue Xuebao* 1987, 22, 837; *Chem. Abstr.* 1988, 108, 164702 e).

C. parthenium (L.) Bernh.

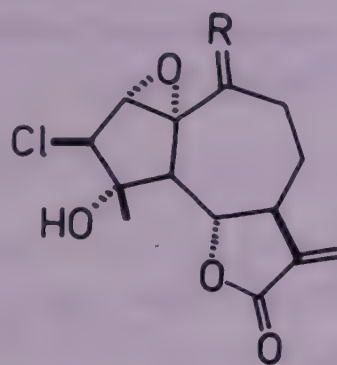
Eng. - Feverfew.

In last few years, drug has become very popular in Great Britain for treatment of migraine and arthritis (*Pharm. J.* 1984, 232, 611; *Brit. Med. J.* 1985, 291, 569).

Two new isomeric chlorine-containing sesquiterpene lactones (I and II) isolated and their structures determined (*Planta Med.* 1988, 54, 171).

Distribution : Jammu & Kashmir.

NEW COMPOUNDS



I

R = α -OH, β -Me

II

R = β -OH, α -Me

C. vulgare (L.) Bernh.; see *Tenacetum vulgare* L.

CHRYSOGONUM (Asteraceae)

C. amottianum (Wt.) Clarke; see *Moonia heterophylla* Arn.

C. heterophyllum (Arn.) Clarke; see *Moonia heterophylla* Arn.

CHRYSOPHYLLUM (Sapotaceae)

C. cainito L.

Eng. - West Indian star apple, Cainito.

Isolation of β -amyrin acetate from stems and leaves (*Ing. Cienc. Quim.* 1983, 7, 22; *Chem. Abstr.* 1985, 102, 21263 c).

Distribution : Native of West Indies and Central America, introduced in Gujarat and Maharashtra.

CICER (Papilionaceae)

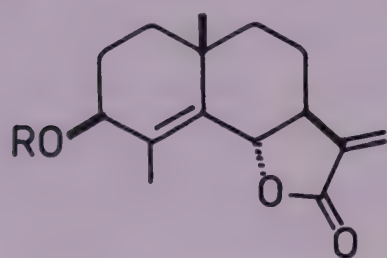
C. arietinum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 167).

Pyrimidine nucleotides - uracil-5- β -D-fructofuranosyl-1'-monophosphate and uracil-5- β -D-ribofuranosyl-2',3'-cyclic monophosphate - isolated from seeds and characterised (*Phytochemistry* 1984, 23, 1779); kaempferol-3-(malonyl)glucoside and kaempferol-3-(apiosyl-malonyl)glucoside identified in leaves and stems (*Phytochemistry* 1988, 27, 3714).

CICHORIUM (Asteraceae)

C. endivia L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 180).

Four new sesquiterpene lactones - cichoriolide A and cichoriosides A, B and C - isolated and characterised (*Chem. Pharm. Bull.* 1988, 36, 2423).

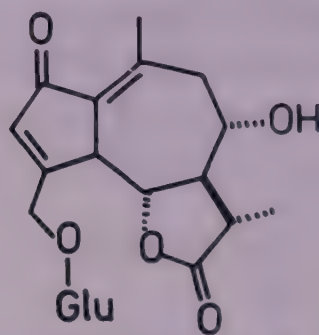
NEW COMPOUNDS

Cichoriolide A

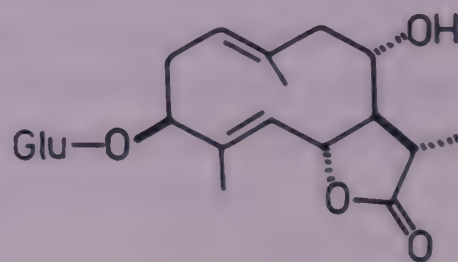
R = H

Cichorioside A

R = Glu



Cichorioside B



Cichorioside C

C. intybus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 168).

Alcoholic extract (69.6 mg/kg) reduced elevated alkaline phosphatase, SGPT and B.S.P. clearance test value to highly significant levels statistically and SGOT and thymol turbidity values came down to markedly low levels in chlorpromazine-induced hepatitis in rats. Decrease in collagen content of liver, increase in body weight and RNA and DNA contents at highly significant levels were observed (*J. Res. Ayurveda & Siddha* 1980, 1, 77).

Cyanidin-3-O- β -(6''-O-malonyl)-D-glucopyranoside isolated from red leaves (*Phytochemistry* 1984, 23, 2968); isolation of lactucin, 8-deoxylactucin and lactupicrin (*Phytochemistry* 1985, 24, 186); cichoriolide A, cichoriosides A, B and C isolated (*Chem. Pharm. Bull.* 1988, 36, 2423).

CINCHONA (Rubiaceae)

C. ledgeriana Moens ex Trimen (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 168).

Norsolorimic acid and β -sitosterol isolated from bark (*Planta Med.* 1988, 54, 469).

CINNAMOMUM (Lauraceae)

C. bejolghota (Buch.-Ham.) Sweet syn. *C. obtusifolium* Roxb. ex Nees (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 65).

Seven new methylflavan-3-ols isolated and characterised as 3'-O-methyl ether, 3',4'-di-O-methyl ether, 5,3'-di-O-methyl ether and 5,7,3'-tri-O-methyl ether of (-)epicatechin; 4'-O-methyl ether, 7,4'-di-O-methyl ether and 5,7,4'-tri-O-methyl ether of (+)catechin; a new compound - 1-(4',6'-dihydroxy-2'-methoxyphenyl)-3-(4''-hydroxy-3''-methoxyphenyl)propan-2-ol - also isolated (*Chem. Pharm. Bull.* 1985, 33, 2281).

C. obtusifolium Roxb. ex Nees; see *C. bejolghota* (Buch.-Ham.) Sweet

C. parthenoxylon (Jack) Meissn. syn. *C. porrectum* (Roxb.) Kosterm.

α -Citral (35.83) and β -citral (28.28%) isolated from essential oil of leaves (*Zhiwu Xuebao* 1984, 26, 639; *Chem. Abstr.* 1985, 102, 119398 a); essential oil of leaves (1.1-1.4%) contained (+)linalool (95.08%) (*Zhiwu Xuebao* 1985, 27, 407; *Chem. Abstr.* 1985, 103, 200687 m).

Distribution : North-east India, Sikkim and Nepal.

C. porrectum (Roxb.) Kosterm.; see *C. parthenoxylon* (Jack) Meissn.

C. tenuipile Kosterm.

Detection of hex-3-en-1-ol, (-)linalool, geraniol, farneol, ocimene, α -copaene, β -caryophyllene, (Z and E) β -farnesenes, α -humulene, γ -cadinene and diphenylamine in leaf oil by GC-MS (*Zhiwu Xuebao* 1987, 29, 537; *Chem. Abstr.* 1988, 108, 81788 m).

Distribution : Nepal, Bhutan, north Bengal and Meghalaya.

C. verum J.S.Presl syn. *C. zeylanicum* Blume (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 173).

Eugenol and benzyl benzoate identified in leaf essential oil of plant grown in Bhuvaneshwar (*Indian Perfum.* 1988, 32, 86; *Chem. Abstr.* 1989, 110, 111779 v); a glucan isolated from stem bark and partially characterised (*Indian J. Chem.* 1988, 27B, 694).

C. zeylanicum Blume; see *C. verum* J.S.Presl

CIRRHOPETALUM (Orchidaceae)

C. elatum Hook.f.; see *Bulbophyllum elatum* (Hook.f.) J.J. Smith

CIRSIUM (Asteraceae)

C. arvense (L.) Scop. syn. *Cnicus arvensis* Hoffm. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 183).

Aplotaxene (Z,Z,Z-1,8,11,14-heptadecatetraene) isolated from roots along with penta-decane, 1-pentadecene and 1-heptadecene and its structure determined (*J. Agric. Food Chem.* 1988, 36, 1043; *Chem. Abstr.* 1988, 109, 125814 u).

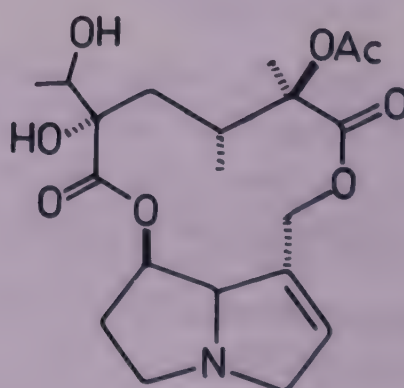
BIOLOGICAL ACTIVITY

Aplotaxene (25.0 µl/l) stimulated teliospore germination of *Puccinia punctiformis* by 50% in 7 days (*J. Agric. Food Chem.* 1988, 36, 1043; *Chem. Abstr.* 1988, 109, 125814 u).

C. wallichii DC. syn. *Cnicus wallichii* (DC.) Clarke, *C. wallichii* (DC.) Clarke var. *nepalensis* (DC.) Hook.f., *C. wallichii* (DC.) Clarke var. *cernua* Hook.f.

Isolation of isorhamnetin-7-glucoside (*Phytochemistry* 1983, 25, 2683); β -sitosterol and its glucoside, taraxasterol, luteolin and its 7-O-glucoside isolated from whole plant (*Fitoterapia* 1988, 59, 78); new alkaloid - O-acetyljacoline - isolated from roots and characterised (*Indian J. Chem.* 1989, 28B, 524).

Distribution : Himalayas, from Kashmir to Bhutan, alt. 1800-3600 m and Nilgiris in south India, alt. 1800 m.

NEW COMPOUNDS

O-Acetyljacoline

CISSAMPELOS (Menispermaceae)

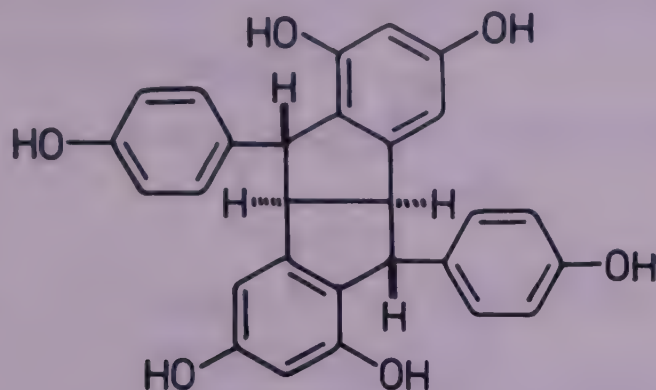
C. pareira L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 184).

Crystal structure of cycleanine determined (*Jiegou Huaxue* 1987, 6, 84; *Chem. Abstr.* 1988, 108, 150785 x).

CISSUS (Vitaceae)

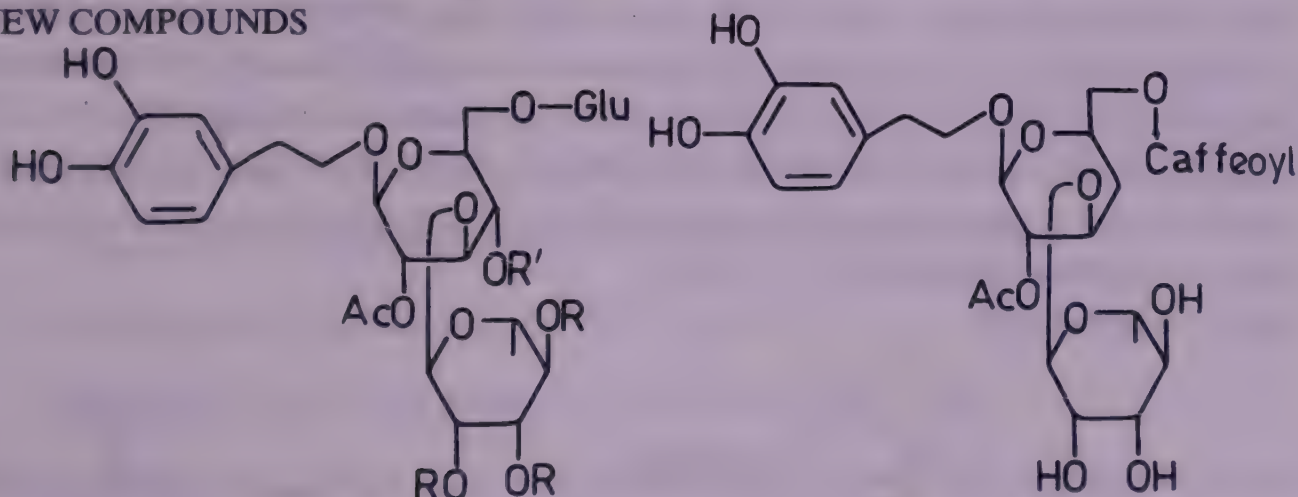
C. pallida (Wt. & Arn.) Planch. syn. *Vitis pallida* Wt. & Arn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 66).

A new dimer - pallidol - isolated from stem wood and characterised (*Phytochemistry* 1986, 25, 1945).

NEW COMPOUNDS**Pallidol****CISTANCHE (Orobanchaceae)**

C. tubulosa (Schrenk) Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 67).

Four new glycosides - tubulosides A, B, C and D - isolated along with echinacoside, acteoside, its isomer and 2'-acetylacteoside and structures of new compounds determined (*Chem. Pharm. Bull.* 1987, 35, 3309).

NEW COMPOUNDS**Tubuloside A**

R = H, R' = Caffeoyl

Tubuloside C

R = Ac, R' = Caffeoyl

Tubuloside D

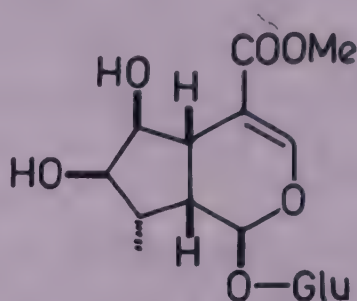
R = Ac, R' = p-Coumaroyl

Tubuloside B

CITHAREXYLUM (Verbenaceae)

C. fruticosum L. syn. *C. subserratum* Sw. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 174).

New iridoid glucoside - 5-deoxypulchelloside I - isolated from leaves together with phlomiol, lamiide and lamiidoside and its structure elucidated (*Planta Med.* 1988, 54, 42).

NEW COMPOUNDS

5-Deoxypulchelloside I

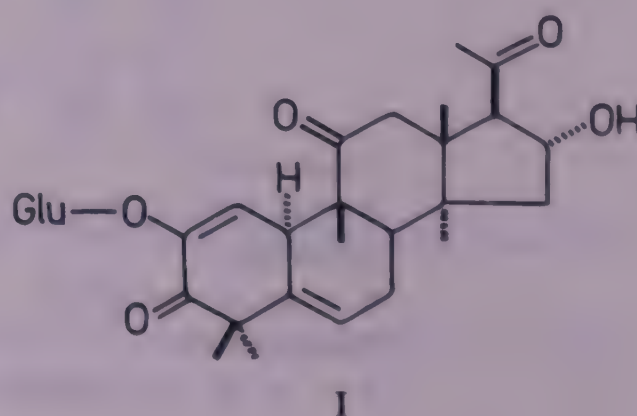
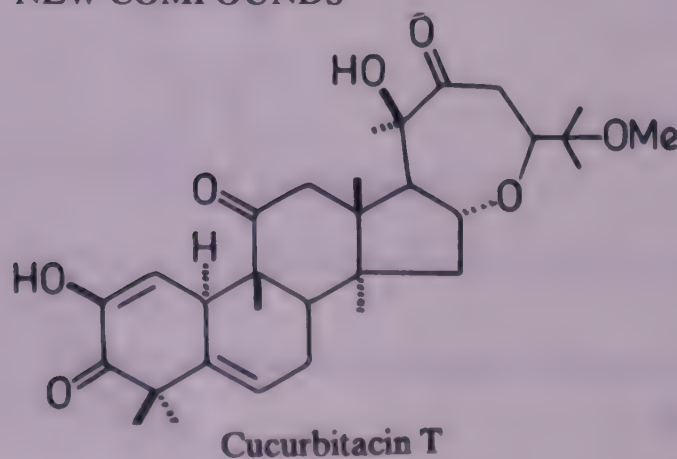
Note : The currently accepted name is *C. fruticosum* L.

C. subserratum Sw.; see *C. fruticosum* L.

CITRULLUS (Cucurbitaceae)

C. colocynthis (L.) Schrad. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 174).

Isolation of hentriacontane, elateridine, hexanorcucurbitacin I and its 16-O-acetyl derivative from fruits (*J. Indian Chem. Soc.* 1987, 64, 448); quercetin and kaempferol isolated from leaves and flowers (*Geobios* 1988, 15, 32; *Chem. Abstr.* 1988, 109, 89702 v); new cucurbitacin T isolated from fruits of Sri Lankan plant and characterised; cucurbitacins I and J also isolated (*Phytochemistry* 1988, 27, 3225); isolation and characterisation of a new glycoside as 2-O- β -D-glucopyranosyl-22,23,24,25,26,27-hexanorcucurbitacin I (I); 2-O- β -D-glucopyranosylcucurbitacin I, 2-O- β -D-glucopyranosylcucurbitacin E and 2-O- β -D-glucopyranosylcucurbitacin L also isolated (*Phytochemistry* 1989, 28, 1268).

NEW COMPOUNDS

C. lanatus (Thunb.) Mats. & Nakai var. *lanatus* syn. *C. vulgaris* Schrad. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 175).

Rutoside, caffeic acid, fraxidin, isofraxidin, daphnetin, pinene and cineole identified in seed essential oil (*Farmacica* 1986, 34, 231; *Chem. Abstr.* 1987, 107, 12738 n); seeds contained codisterol, 25(27)-dehydroporiferasterol, clerosterol, isofucosterol, stigmasterol, campesterol, sitosterol, 25(27)-dehydrofungisterol, 25(27)-dehydrochondrillasterol, 24 β -ethyl-25(27)-dehydrolathosterol, avenasterol, spinasterol, 24 ξ -methyllathosterol and 22-dihydro-spinasterol (*Phytochemistry* 1986, 25, 2591).

C. vulgaris Schrad.; see *C. lanatus* (Thunb.) Mats. & Nakai var. *lanatus*

CITRUS (Rutaceae)

C. aurantium L. syn. *C. aurantium* var. *bigaradia* Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 175).

Six polymethoxylated flavonoids from pericarp inhibited sedimentation of human erythrocytes; rate of sedimentation decreased with increase in number of methoxy groups (*Acta Farm. Bonaerense* 1985, 4, 33; *Chem. Abstr.* 1986, 104, 101945 h).

α -, β -Pinenes, limonene, octanol and citronellal isolated from leaves (*J. Chem. Ecol.* 1985, 11, 1527; *Chem. Abstr.* 1986, 104, 48755 t); asymmetric synthesis of limonene (*Tetrahedron* 1986, 42, 2193); flower oil contained linalool (50.46), limonene (9.13) and myrcene (6.26%); leaf oil contained linalool (11.72) and linalyl acetate (18.39%); peel oil contained limonene (96.41%) (*Zhiwu Xuebao* 1986, 28, 635; *Chem. Abstr.* 1987, 106, 182421 a); umbelliferone, naringin, hesperidin and neohesperidin identified in fruits (*Chunghua Yao Hsueh Tsa Chih* 1989, 41, 247; *Chem. Abstr.* 1989, 111, 201452 h).

BIOLOGICAL ACTIVITY

α -, β -Pinenes, limonene, octanol and citronellal inhibited seed germination and seedling growth of *Amaranthus retroflexus* (*J. Chem. Ecol.* 1985, 11, 1527; *Chem. Abstr.* 1986, 104, 48755 t).

C. aurantium L. var. *bergamia* Risso; see *C. bergamia* Risso & Poit.

C. aurantium var. *bigaradia* Hook.f.; see *C. aurantium* L.

C. aurantium L. var. *khatta* Bonavia; see *C. karna* Rafin.

C. bergamia Risso & Poit. syn. *C. aurantium* L. var. *bergamia* Risso (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 176).

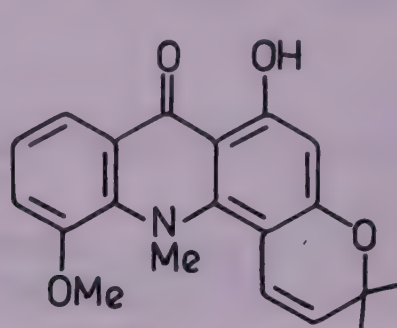
Bergapten detected in oil by HPLC (*Analyst* 1987, 112, 195; *Chem. Abstr.* 1987, 106, 125700 s); (+) limonene, linalool and linalyl acetate identified by GC-MS in peel oil (*Zhiwu Xuebao* 1987, 29, 77; *Chem. Abstr.* 1987, 106, 182429 j).

C. decumana L.; see *C. grandis* (L.) Osbeck

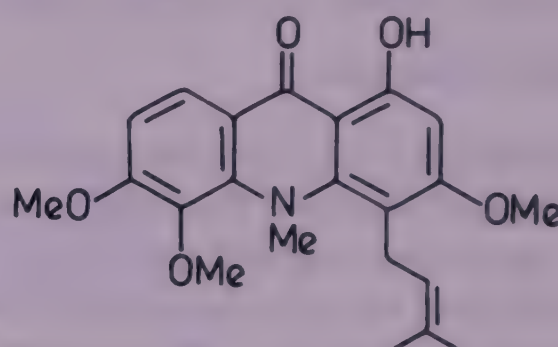
C. grandis (L.) Osbeck syn. *C. maxima* (Burm.) Merr., *C. decumana* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 176).

Identification of nomilin, limonin, deoxylimonin and obacunone in seeds and juicy hair by HPLC (*Nippon Shokuhin Kogyo Gakkaishi* 1985, 32, 590; *Chem. Abstr.* 1986, 104, 145558 p); pyranoacridone alkaloid - honyumine - isolated from root bark and characterised (*Heterocycles* 1986, 24, 41); isolation and structure elucidation of two new acridone alkaloids - baiyumines A and B - from root bark (*Phytochemistry* 1987, 26, 871).

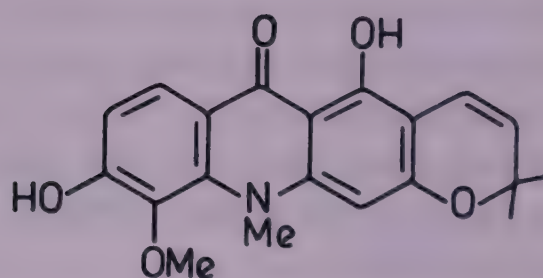
NEW COMPOUNDS



Baiyumine A



Baiyumine B



Honyumine

C. japonica Thunb.; see *Fortunella japonica* (Thunb.) Swingle

C. karna Rafin. syn. *C. aurantium* L. var. *khatta* Bonavia

H. - Karna khatta; Mar. - Idlimbu; Assam - Soh-sarkar; P. - Kimb, Mokri.

Sitosterol (36.9), campesterol (36.4), stigmasterol (26.2) and cholesterol (0.6%) determined in roots by GC-MS (*Phytochemistry* 1985, 24, 2469).

Distribution : Cultivated in Khasia Hills, Uttar Pradesh and Punjab and popular as rootstock for other *Citrus* species of commercial value.

C. limon (L.) Burm.f. syn. *C. medica* L. var. *limonum* (Risso) Hook.f., *C. limonum* Risso, *C. medica* L. var. *limon* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 177).

New glycosides - citrusins A, B, C and D - isolated from fruit peel along with coniferin, syringin and dehydrodiconiferyl alcohol-4 β -glucoside (*Nippon Nogeikagaku Kaishi* 1988, 62, 1067; *Chem. Abstr.* 1988, 109, 146351 f).

NEW COMPOUNDS

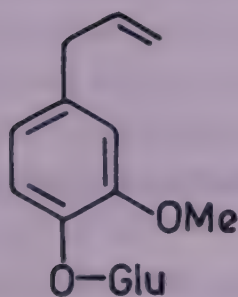


Citrusin A

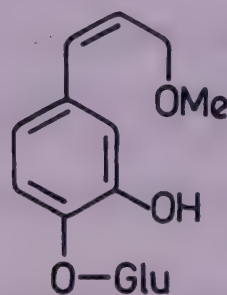
R = H

Citrusin B

R = OMe



Citrusin C



Citrusin D

BIOLOGICAL ACTIVITY

Coniferin and syringin (1.0 mg/100 g, i.v.) raised blood pressure of SHR-SP rats whereas dehydrodiconiferylalcohol-4 β -glucoside, citrusins A, C and D lowered it at same dose (*Nippon Nogeikagaku Kaishi* 1988, 62, 1067; *Chem. Abstr.* 1988, 109, 146351 f).

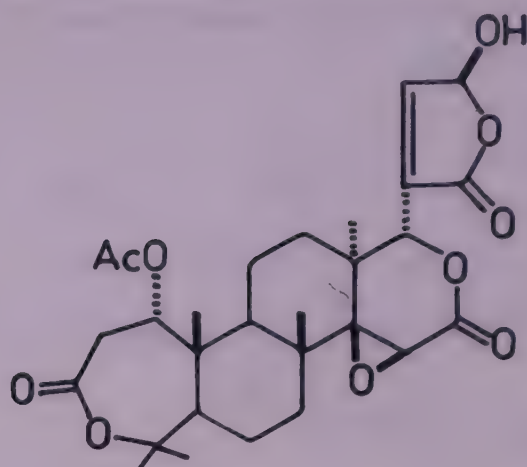
C. limonum Risso; see *C. limon* (L.) Burm.f.

C. maxima (Burm.) Merr.; see *C. grandis* (L.) Osbeck

C. medica L. syn. *C. medica* L. var. *medica* (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 68).

Limonene, neral, geranial, p-cymene, geranyl acetate and 6-methyl-5-hepten-2-one detected in essential oil by GC-MS (*Yunnan Zhiwu Yanjiu* 1984, 6, 457; *Chem. Abstr.* 1985, 102, 50702 a); campesterol (38.1), sitosterol (31.8), stigmasterol (29.4) and cholesterol (0.7%) determined in roots by GC-MS (*Phytochemistry* 1985, 24, 2469); new triterpenoid - citrusin - isolated from fruits along with palmitic and succinic acids, citropten, β -sitosterol and daucosterol and its structure elucidated (*Zhongcaoyao* 1986, 17, 530; *Chem. Abstr.* 1987, 107, 28253 m).

NEW COMPOUNDS



Citrusin

C. medica L. var. *limon* L.; see *C. limon* (L.) Burm.f.

C. medica L. var. *limonum* (Risso) Hook.f.; see *C. limon* (L.) Burm.f.

C. medica L. var. *medica*; see *C. medica* L.

C. nobilis Lour.; see *C. reticulata* Blanco

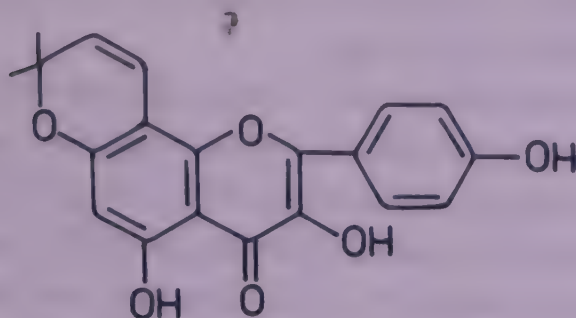
C. paradisi Macf. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 178).

Naringin and isorhoifolin identified in leaves (*Khim. Prir. Soedin.* 1985, 409; *Chem. Abstr.* 1985, 103, 51219 f); stereoselective synthesis of nootkatone and valencene (*J. Org. Chem.* 1985, 50, 3615).

C. reticulata Blanco syn. *C. nobilis* Lour. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 178).

Sitosterol (34.4), campesterol (24.2), stigmasterol (18.1) and cholesterol (3.1%) determined by GC-MS in roots (*Phytochemistry* 1985, 24, 2469); isolation and characterisation of α -(methylamino)methyl-4-hydroxyphenyl-methanol (*Zhongyao Tongbao* 1985, 10, 77; *Chem. Abstr.* 1985, 103, 59144 y); 7-hydroxy- 5,6,3',4'-tetramethoxyflavone and 3'-hydroxy-5,6,7,8,4'-pentamethoxyflavone isolated from leaves (*J. Nat. Prod.* 1987, 50, 751); new 2,2-dimethylpyranoflavanol - citrusinol - isolated from root bark in addition to elemol, suberosin, suberenol, crenulatin, xanthyletin, xanthoxyletin, nordentatin, citropone A, 5-hydroxynoracronycine, citrusinine I, citracridone I and p-hydroquinone (*Phytochemistry* 1987, 26, 3094); determination of limonene (99.17%) in oil by GC (*Yaowu Fenxi Zazhi* 1989, 9, 177; *Chem. Abstr.* 1989, 111, 120593 c).

NEW COMPOUNDS

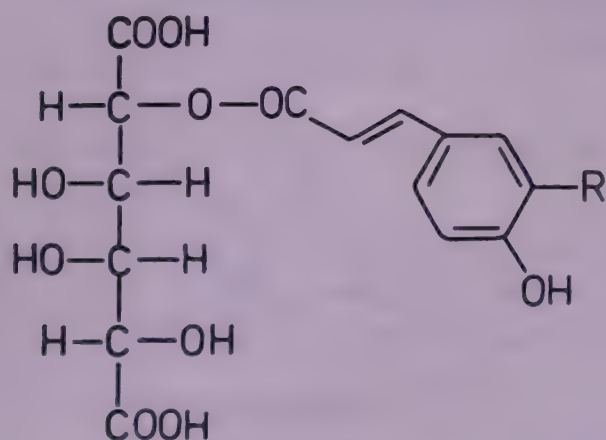


Citrusinol

C. sinensis (L.) Osbeck (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 187).

Isolation of 2'(E)O-p-coumaroyl- and 2'(E)O-feruloylgalactaric acids from peels (*Phytochemistry* 1987, 26, 509); dihydrokaempferol-4'-O-methyl-7-O-rhamnoside isolated from pulp of mature fruits (*Phytochemistry* 1988, 27, 946); isolation of 2'(E)O-p-coumaroyl-, 2'(E)O-feruloyl- and 2',4'(E,E)O-diferuloylgucaric acid esters from peels (*Phytochemistry* 1988, 27, 3327); two new monoterpenoid glycosides isolated from peels and characterised as trans-carveol-6- β -D-glucopyranoside and α -terpineol-8 β -D-glucopyranoside; (2E,6R)2,6-dimethyl-2,7-octadien-6-ol-1-O- β -D-glucopyranoside, vomifoliol-9-O- β -D-glucopyranoside and (6R,7E,9R)9-hydroxymegastigma-4,7-dien-3-one-9-O- β -D-glucoside also isolated (*Yukagaku* 1988, 37, 13; *Chem. Abstr.* 1988, 109, 3770 s).

NEW COMPOUNDS



2'(E)O-p-Coumaroylgalactaric acid

R = H

2'(E)O-Feruloylgalactaric acid

R = OMe

C. unshiu Macroitch

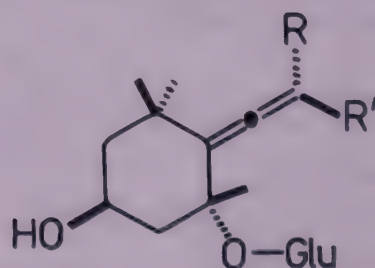
Eng. - Japanese mandarin, Satsuma mandarin, Satsuma orange.

Plant extract induced oviposition by female of a citrus-feeding swallowtail butterfly, *Papilio xuthus* (*Experientia* 1987, 43, 342).

Hesperetin-7-neohesperidoside and -7-rutinoside isolated from peels (*Khim. Prir. Soedin.* 1984, 656; *Chem. Abstr.* 1985, 102, 42885 x); rutin and luteolin-7-rutinoside isolated from leaves (*Khim. Prir. Soedin.* 1984, 656; *Chem. Abstr.* 1985, 102, 42884 w); new flavonol glycoside - limocitrin-3- α -L-rhamnoside - and new flavone glycoside - 3,6-di-C-glucosylapigenin - isolated from peels along with limocitrin-3- β -D-glucoside, narirutin, rutin and narcissin (*Agric. Biol. Chem.* 1985, 49, 909; *Yukagaku* 1989, 38, 53; *Chem. Abstr.* 1989, 110, 189403 n); coniferin, syringin, dehydrodiconiferyl alcohol-4 β -glucoside and citrusins A, B, C and D isolated from peels (*Nippon Nogei Kagaku Kaishi* 1988, 62, 1067; *Chem. Abstr.* 1988, 109, 146351 f); isolation and structure elucidation of two new glycosides - citrosides A and B - from leaves; in addition, limonin, friedelin, 2-phenylethyl- β -D-glucopyranoside and 2-phenylethyl-D-rutinoside isolated (*Chem. Pharm. Bull.* 1988, 36, 5004); hesperidin, 3-hydroxy-5,6,7,8,3',4'-hexamethoxyflavone-3- β -D-glucoside, 6,8-di-C-glucosylapigenin, 3,8-di-C-glucosylapigenin, 3,7,4'-trihydroxy-5,6,8,3'-tetramethoxyflavone-3- β -D-glucoside, 3,7,4'-trihydroxy-5,6,8,3'-tetramethoxyflavone-3-O-[6''-(3-hydroxy-3-methylglutaryl)]- β -D-glucoside and limocitrin-3-O-[6''-(3-hydroxy-3-methylglutaryl)]- β -D-glucoside isolated from peels of young fruit; relationship between structure and hypotensive activity of these flavonoid glycosides studied (*Yukagaku* 1989, 38, 53; *Chem. Abstr.* 1989, 110, 189403 n).

Distribution : Native to Japan, introduced into India in Saharanpur (Uttar Pradesh), Patiala (Punjab) and Kodagu (Karnataka).

NEW COMPOUNDS



Citroside A

R = H, R' = Ac

Citroside B

R = Ac, R' = H

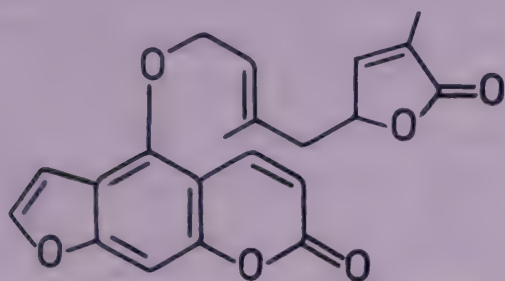
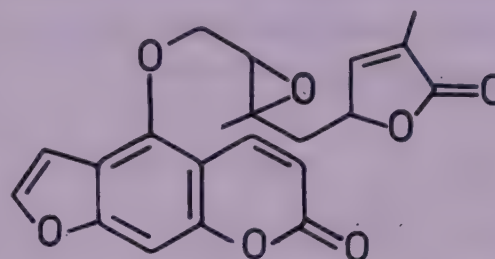
BIOLOGICAL ACTIVITY

Rutin and 3,6-di-C-glucosylapigenin showed depressing effect and lowered blood pressure of SHR-SP rats at 1.0 mg/100 g body weight (*Agric. Biol. Chem.* 1985, 49, 909); 5-hydroxy-N ω -methyltryptamine, adenosine, vicenin 2, rutin, narirutin and hesperidin stimulated oviposition by swallowtail butterfly, *Papilio xuthus* (*Experientia* 1987, 43, 342).

CLAUSENA (Rutaceae)***C. anisata* Hook.f.**

Two new furanocoumarin lactones - anisolactone and 2',3'-epoxyanisolactone - together with xanthotoxol and indicolactonediol isolated and characterised (*Phytochemistry* 1984, 23, 2629; *Indian Drugs* 1987, 24, 285); in addition imperatorin, lansamide I and indicolactone isolated (*Phytochemistry* 1984, 23, 2629).

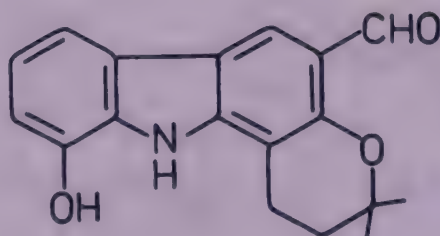
Distribution : Native of tropical Africa, introduced into Indian gardens.

NEW COMPOUNDS**Anisolactone****2',3'-Epoxyanisolactone****BIOLOGICAL ACTIVITY**

Xanthotoxol, anisolactone, indicolactone, 2',3'-epoxyanisolactone and anisolactonediol counteracted acetylcholine, histamine and barium chloride-induced contraction in isolated guinea pig ileum; most potent compound, anisolactone also showed spasmolytic activity *in vivo* in gastrointestinal tract of cats and mice (*Indian Drugs* 1987, 24, 285).

C. heptaphylla W. & A. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 179).

A new carbazole alkaloid - heptazolicine - isolated from roots and its structure elucidated (*Phytochemistry* 1984, 23, 2409); confirmation of structure of heptazoline (*J. Indian Chem. Soc.* 1985, 62, 600); structure of heptazolidine determined (*J. Indian Chem. Soc.* 1985, 62, 670); synthesis of heptazolidine (*J. Indian Chem. Soc.* 1985, 62, 673).

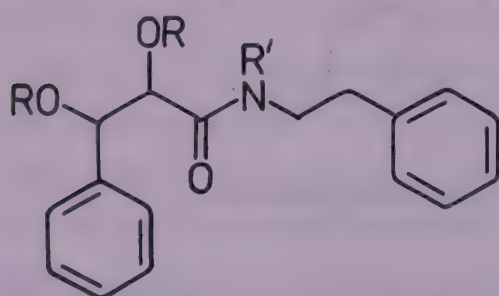
NEW COMPOUNDS**Heptazolicine**

C. lansium (Lour.) Skeels syn. *C. wampi* Blanco (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 179).

Crude extract of leaves used for treatment of acute and chronic viral hepatitis; it lowered elevated SGPT level (*Yaoxue Xuebao* 1987, 22, 33; *Chem. Abstr.* 1987, 106, 153109 z); extract of aerial parts showed spasmolytic activity in guinea pig ileum (*Indian Drugs* 1988, 26, 105).

New amide - clausenamide - isolated (*Yaoxue Xuebao* 1987, 22, 33; *Chem. Abstr.* 1987, 106, 153109 z; *Phytochemistry* 1988, 27, 445); cyclic amides - neoclausenamide and cycloclausenamide - isolated from leaves; crystal structures of clausenamide and cycloclausenamide determined by X-ray analysis (*Phytochemistry* 1988, 27, 445); isolation of lansimide (*Indian Drugs* 1988, 26, 105); aromatic amides (I, II, III, IV and V) isolated (Ger. 3,700,704 (1987) Jul. 23; *Chem. Abstr.* 1988, 108, 118960 g); isolation of lansiumamides A, B and C from seeds and their structure elucidation (*Phytochemistry* 1989, 28, 621); tetracyclic triterpene alcohol - lansiol - isolated and its structure determined (*Phytochemistry* 1989, 28, 943).

NEW COMPOUNDS



I

R, R' = H

II

R = H, R' = Me

III

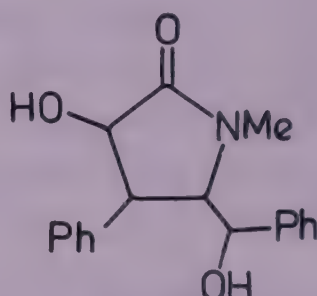
R = Acyl, R' = H

IV

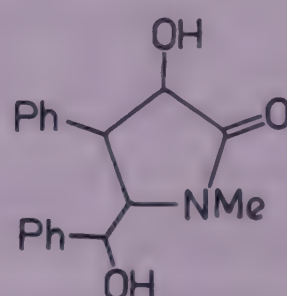
R = Acyl, R' = Me

V

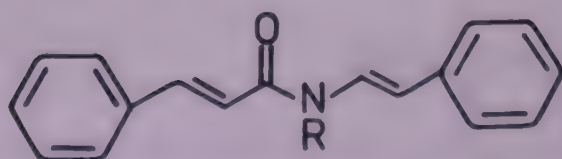
R, R' = Isopropyl



Clausenamide



Neoclausenamide

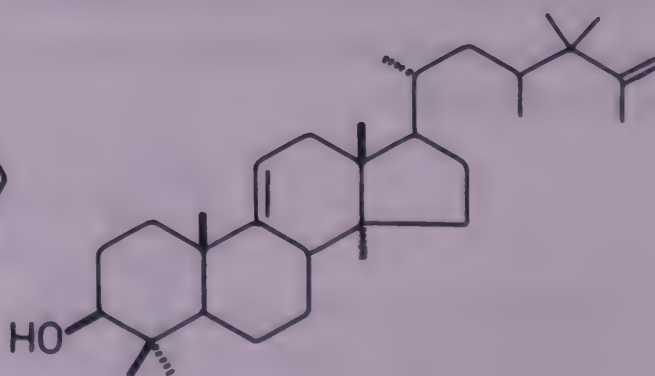


Lansiumamide A

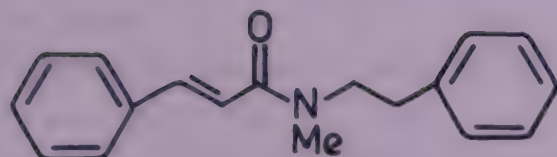
R = H

Lansiumamide B

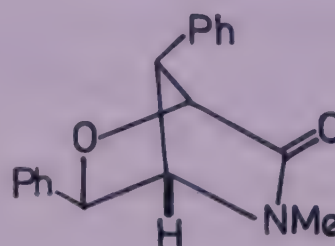
R = Me



Lansiol



Lansiumamide C



Cycloclausenamide

BIOLOGICAL ACTIVITY

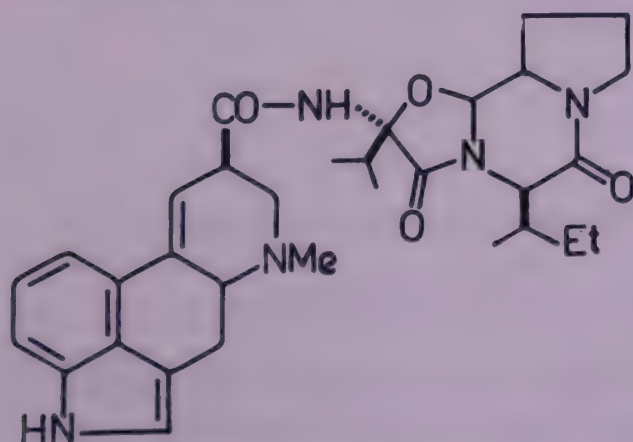
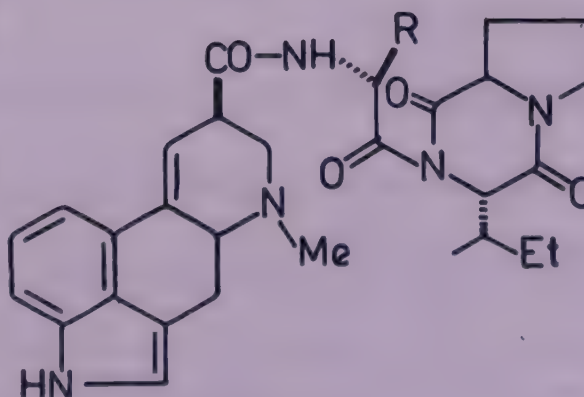
Dehydroindicolactone exhibited spasmolytic activity in smooth muscle preparations (*Gen. Pharmacol.* 1986, 17, 593; *Chem. Abstr.* 1987, 106, 499 b); clausenamide and cycloclausenamide lowered elevated SGPT level in mice treated with carbon tetrachloride (*Yaoxue Xuebao* 1987, 22, 23; *Chem. Abstr.* 1987, 106, 153109 z; *Phytochemistry* 1988, 27 445); administration of aromatic amide (II) decreased serum SGPT level in carbon tetrachloride-treated mice to 727 units from 1678 in controls (Ger. 3,700,704 (1987) Jul. 23; *Chem. Abstr.* 1988, 108, 118960 q); lansimide showed spasmolytic activity (*Indian Drugs* 1988, 26, 105).

C. wampi Blanco; see *C. lansium* (Lour.) Skeels

CLAVICEPS (Clavicipitaceae)

C. purpurea (Fr.) Tul. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 180).

Three new alkaloids - 5'-epimer of β -ergocryptine, β -ergocryptam and β,β -ergoannam - isolated along with α - and β -ergocryptines and ergocornine from saprophytic culture; new compounds characterised (*J. Nat. Prod.* 1984, 47, 970); synthesis of agroclavine (*Chem. Pharm. Bull.* 1986, 34, 948).

NEW COMPOUNDS β -Ergocryptine 5'-epimer β -ErgocryptamR = CHMe₂ β,β -ErgoannamR = CH(Me)CH₂Me

BIOLOGICAL ACTIVITY

Elymoclavine at 2.0-10.0 mg/kg induced dose-dependent stereotypy in rats and mice which was antagonised by haloperidol; it prevented development of haloperidol catalepsy in rats and decreased plasma level of prolactin. It inhibited picrotoxin and electroshock convulsive seizures but potentiated pentylenetetrazole convulsions in mice; its LD₅₀ was 350 mg/kg for mice and 145 mg/kg for rats (*Biomed. Biochim. Acta* 1984, 43, 1305; *Chem. Abstr.* 1985, 102, 72756 y); i.p. administration of dihydroergocristine and dihydroergocryptine for 2 months to male rats aged 10 months, caused dose-related increase of reduced glutathione in forebrain (*Farmacol. Ed. Sci.* 1988, 43, 887; *Chem. Abstr.* 1989, 110, 107892 j); vasodilator response to acetylcholine and betanecol in segments of rabbit carotid, superior mesenteric and femoral arteries precontracted with phenylephrine and with intact endothelium, was enhanced by ergotamine when vessels were preincubated with ergotamine for 60 min. Vasodilator response to acetylcholine and its enhancement by ergotamine completely prevented by methylene blue pretreatment (*Eur. J. Pharmacol.* 1989, 159, 195).

CLEISTANTHUS (Euphorbiaceae)

C. collinus (Roxb.) Benth. ex Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 181).

Leaf extract caused impairment of neuromuscular function, as evidenced by marked decrement in nerve-evoked muscle action potentials and corresponding fade in nerve-evoked muscle tension in phrenic nerve-diaphragm preparation in rats but marginally affected muscle-evoked muscle action potentials; thus mortality due to leaf poisoning may be due to irreversible neuromuscular blocking (*Arogya* 1988, 14, 42).

Phloroglucinol, (+)catechin, (+)gallocatechin, (-)epigallocatechin, prodelpinidin B4 and protocathechuic, p-coumaric, p-hydroxybenzoic and gallic acids isolated from bark whereas (-)epicatechin from wood (*Leather Sci.* 1985, 32, 65; *Chem. Abstr.* 1985, 103, 175442 t).

CLEOME (Capparaceae)

C. brachycarpa Vahl ex DC.; see *C. vahliana* Farsen.

C. brachycarpa Vahl ex DC. var. *glauca* Blatt. & Hall.; see *C. vahliana* Farsen.

C. brachycarpa Vahl ex DC. var. *longipetiolata* Sabins; see *C. vahliana* Farsen.

C. gynandra L. syn. *C. pentaphylla* L., *Gynandropis gynandra* (L.) Briq., *G. pentaphylla* (L.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 182).

5,7-Dihydroxychromone, 5-hydroxy-3,7,4'-trimethoxyflavone and luteolin isolated from seeds (*J. Nat. Prod.* 1985, 48, 332); leaves of Egyptian plant afforded centaureidin, kaempferol

and its 3-O-diglucoside, quercitrin, myricitrin, α - and β -amyrins, taraxasterol, β -sitosterol and capric, lauric, myristic, palmitic, palmitoleic, stearic, oleic and linoleic acids (*Bull. Pharm. Sci., Assiut Univ.* 1987, 10, 74; *Chem. Abstr.* 1989, 110, 21140 a).

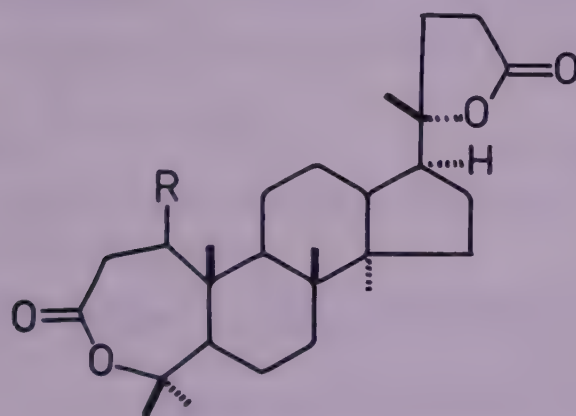
C. icosandra L.; see *C. viscosa* L.

C. pentaphylla L.; see *C. gynandra* L.

C. vahliana Farsen. syn. *C. brachycarpa* Vahl ex DC., *C. brachycarpa* Vahl ex DC. var. *glauca* Blatt. & Hall., *C. brachycarpa* Vahl ex DC. var. *longipetiolata* Sabins (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 70).

A new trinortriterpenoid dilactone - brachycarpone - isolated and its structure and absolute configuration determined (*J. Nat. Prod.* 1986, 49, 249); isolation of deacetoxybrachycarpone along with cabralealactone and ursolic acid and its structure elucidation (*Phytochemistry* 1987, 26, 315).

NEW COMPOUNDS



Brachycarpone

R = β -OAc

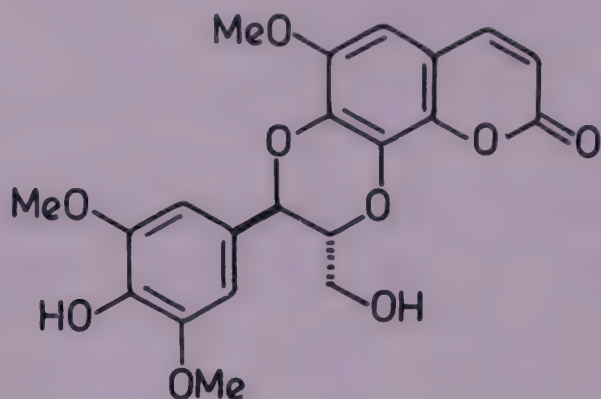
Deacetoxybrachycarpone

R = H

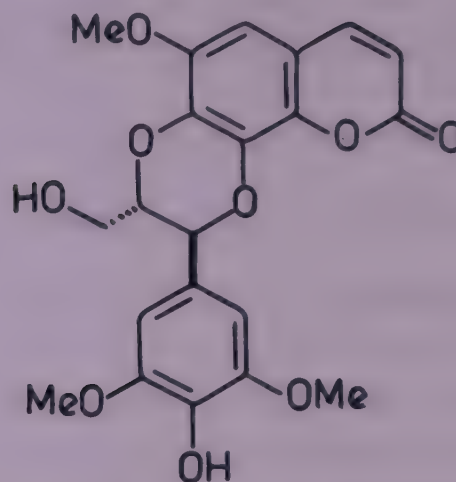
C. viscosa L. syn. *C. icosandra* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 182).

New coumarinolignan - cleomiscosin C - together with cleomiscosins A and B isolated from seeds and its structure determined (*Tetrahedron* 1985, 41, 209); two new unsaturated cembrane acids isolated and their structures established by X-ray crystallography as (1R,3E,7Z,12R)20-hydroxycembra-3,7,15-trien-19-oic acid (I) and (3E,7Z,11Z)17,20-dihydroxycembra-3,7,11,15-tetraen-19-oic acid (II) (*Aust. J. Chem.* 1985, 38, 1365); seeds afforded new coumarinolignan - cleomiscosin D - which has been proved to be regioisomer of cleomiscosin C (*Phytochemistry* 1988, 27, 636).

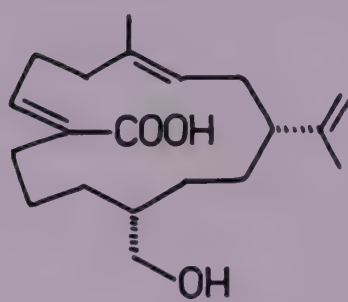
NEW COMPOUNDS



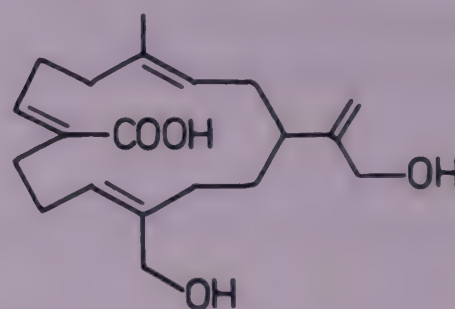
Cleomiscosin C



Cleomiscosin D



I



II

BIOLOGICAL ACTIVITY

Cleomiscosins A, B and C exhibited liver protective property (*Tetrahedron* 1985, 41, 209).

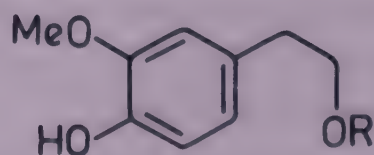
CLERODENRUM (CLERODENDRON) (Verbenaceae)

C. aculeatum L.

A phenylpropanoid glycoside - cistanoside D - isolated together with acteoside (*Plant. Med. Phytother.* 1989, 23, 1; *Chem. Abstr.* 1989, 111, 212008 u).

Distribution : Native of America, introduced into Indian gardens.

NEW COMPOUNDS



Cistanoside D

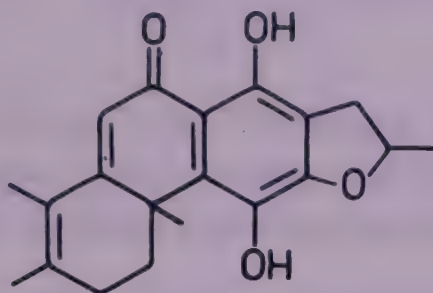
R = (4-feruloyl)Glu(3→1)Rha

C. fragrans Hort. ex Vent.; see *C. philippinum* Schauer

C. indicum (L.) O.Kuntze syn. *C. siphonanthus* R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 184).

A diterpene hydroquinone - uncinatone - isolated from leaves and stems along with pectolinarigenin (*Indian J. Chem.* 1988, 27B, 696; *J. Agric. Food Chem.* 1989, 37, 234; *Chem. Abstr.* 1989, 110, 54470 m).

NEW COMPOUNDS



Uncinatone

BIOLOGICAL ACTIVITY

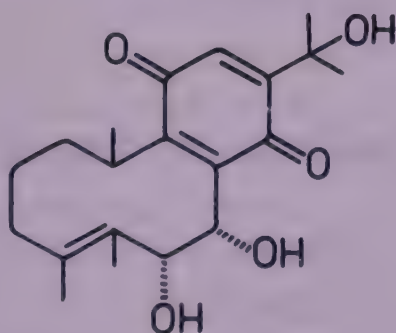
Uncinatone and pectolinarigenin inhibited feeding of adult rice weevil, *Sitophilus oryzae* (*J. Agric. Food Chem.* 1989, 37, 234; *Chem. Abstr.* 1989, 110, 54470 m).

C. infortunatum L.; see *C. viscosum* Vent.

C. nerifolium (Roxb.) Wall. ex DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 195).

β -Sitosterol, α -amyrin acetate, lupeol and its acetate, ursolic and betulinic acids isolated from stem bark (*Indian J. Pharm. Sci.* 1985, 47, 167); nerifolinol isolated from bark and characterised (*Indian Drugs* 1986, 23, 640).

NEW COMPOUNDS



Nerifolinol

C. nutans Wall. ex D.Don; see *C. wallichii* Merrill

C. philippinum Schauer syn. *C. fragrans* Hort. ex Vent. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 185).

Uncinatone and its isomer isolated (*Indian J. Chem.* 1988, 27B, 696); isolation of two minor sterols - 24 β -methylcholesta-5,22(E),25-trien-3 β -ol and 24 α -ethyl-5 α -cholest-22(E)-en-3 β -ol (*Phytochemistry* 1988, 27, 241); 24-ethylcholesta-5,22(E)-dien-3 β -ol isolated and shown to be epimeric mixture of 24 α (major) and 24 β (minor) isomers by NMR studies (*Phytochemistry* 1988, 27, 1169).

C. siphonanthus R.Br.; see *C. indicum* (L.) O.Kuntze

C. splendens G.Don

Clerodolone, friedelan-3 β -ol, friedelan-3-one, β -amyrin, n-triacontane and 24(S)ethylcholesta-5,22,25-trien-3 β -ol isolated from aerial parts (*J. Indian Chem. Soc.* 1985, 62, 409).

Distribution : Native of tropical Africa, grown in Indian gardens.

C. viscosum Vent. syn. *C. infortunatum* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 185).

24-Ethylcholesta-5,22(E)-dien-3 β -ol isolated and shown to be epimeric mixture of 24 α (major) and 24 β (minor) isomers by NMR studies (*Phytochemistry* 1988, 27, 1169); configurations at C-24 of major sterols, 24-ethyl-25-dehydrocholesterol and 24-ethyl-22,25-bisdehydrocholesterol and two minor sterols, 24-ethylcholesterol and 24-ethyl-22-dehydrocholesterol determined as 24 α whereas 24-methylcholesterol shown to be epimeric mixture in which 24 α -epimer predominates (*Indian J. Chem.* 1988, 27B, 17).

C. wallichii Merrill syn. *C. nutans* Wall. ex D.Don

Meghalaya - Syntew-law-hariam.

Aerial parts afforded clerodolone, clerosterol, β -sitosterol, stigmasterol and 24(S)ethylcholesta-5,22,25-trien-3 β -ol (*J. Indian Chem. Soc.* 1985, 62, 409).

Distribution : Sikkim, Meghalaya and eastwards.

CLITORIA (Papilionaceae)

C. ternatea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 186).

Six acylated anthocyanins - ternatins A, B, C, D, E and F - isolated from blue flowers along with kaempferol and its 3-glucoside, robinin, quercetin and its 3-glucoside; ternatins A and B partially characterised (*Phytochemistry* 1985, 24, 1583).

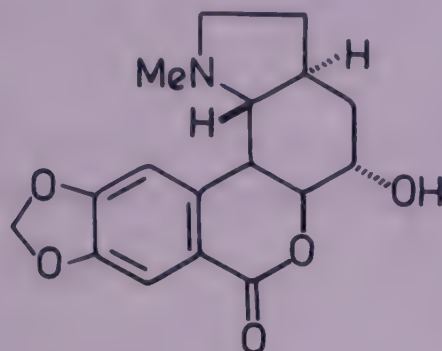
CLIVIA (Amaryllidaceae)

C. nobilis Lindl.

A new alkaloid - nobilisine - isolated together with clivatine and lycorine from Egyptian plant and characterised (*J. Nat. Prod.* 1988, 51, 549).

Distribution : Grown in Indian gardens.

NEW COMPOUNDS



Nobilisine

CNICUS (Asteraceae)

C. arvensis Hoffm.; see *Cirsium arvense* (L.) Scop.

C. wallichii (DC.) Clarke; see *Cirsium wallichii* DC.

C. wallichii (DC.) Clarke var. *cernua* Hook.f.; see *Cirsium wallichii* DC.

C. wallichii (DC.) Clarke var. *nepalensis* (DC.) Hook.f.; see *Cirsium wallichii* DC.

CNIDIUM (Apiaceae)

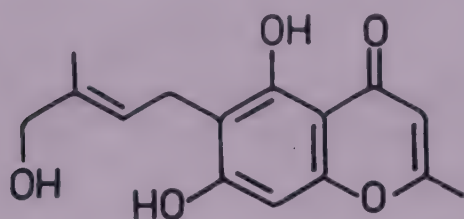
C. monnieri (L.) Cusson syn. *Seseli daucifolium* Clarke, *Selinum monnieri* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 186).

Oral administration of total coumarins from fruit to guinea pigs provided protection against bronchospasm induced by histamine; *in vitro*, coumarins inhibited contraction of guinea pig trachea and ileum induced by histamine. Coumarins also exhibited anti-allergic action and antitussive effect and prolonged barbitol-induced sleep in mice; LD₅₀ (oral) in mice, 2.44 g/kg (*Zhongyao Tongbao* 1986, 11, 114; *Chem. Abstr.* 1986, 104, 179757 t).

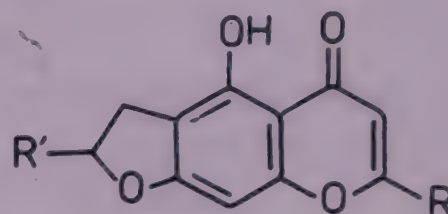
Identification of palmitic acid, osthol, β -sitosterol, bergapten, isopimpinellin and xanthoxol in fruits (*Zhongcaoyao* 1984, 15, 14; *Chem. Abstr.* 1986, 104, 65929 v); determination of osthol (0.61-1.49) and imperatorin (0.53-1.0%) in fruits of Korean and Chinese plants (*Nanjing Yaoxueyuan Xuebao* 1985, 16, 10; *Chem. Abstr.* 1985, 103, 193188 u); edultin and isobutyryloxy columbianetin identified in fruits (*Yaowu Fenxi Zazhi* 1985, 5, 308; *Chem. Abstr.* 1986, 104, 39567 f); umtatin, cnidimols A and B and cniforin B isolated from fruits and characterised (*Shoyakugaku Zasshi* 1985, 39, 282; *Chem. Abstr.* 1986, 105, 85018 w); xanthotoxin and imperatorin isolated from fruits (*Zhongcaoyao* 1986, 17, 6; *Chem. Abstr.* 1986,

104, 183344 y); identification of β -bisabolene, borneol, bornyl acetate, but-2-ene, camphene, trans-carveol, dihydrocarvone, geranyl acetate, geranyl isobutyrate, isopropyl isobutyrate, limonene, linalool, myrcene, myrtenol; α - and β -pinenes, γ -terpinene and verbenone in essential oil by GC-MS (*Nanjing Yaoxueyuan Xuebao* 1986, 17, 167; *Chem. Abstr.* 1987, 106, 72678 g); murraol synthesised (*Phytochemistry* 1989, 28, 227).

NEW COMPOUNDS



Cnidimol A

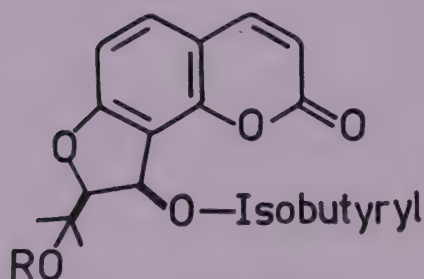


Cnidimol B

R = Me, R' = β -C(Me)(OH)CH₂OH

Umtatin

R = CH₂OH, R' = C(Me)=CH₂



Cniforin B

R = Angeloyl

BIOLOGICAL ACTIVITY

Imperatorin exhibited anti-allergic activity (*Chem. Pharm. Bull.* 1985, 33, 1676); oral administration of osthol inhibited passive cutaneous anaphylaxis in mice and histamine-induced asthma in guinea pigs; it also inhibited contraction induced by ovalbumin in isolated ileum of guinea pigs. The slow reacting substance A-induced contraction of isolated guinea pig ileum was also inhibited by osthol; in rats i.p. injection of osthoi antigen-induced degranulation of mast cells (*Yaoxue Xuebao* 1988, 23, 96; *Chem. Abstr.* 1988, 108, 216006 c).

COCCINIA (Cucurbitaceae)

C. cordifolia Cogn.; see *C. grandis* (L.) Voigt

C. grandis (L.) Voigt syn. *C. cordifolia* Cogn., *C. indica* W. & A., *Cephalandra indica* Naud. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 196).

Clinical evaluation of green leaves extract at a dose of 10.0 g/day showed significant inhibition of infective hepatitis starting from third or fourth day of treatment (*J. Res. Ayurveda & Siddha* 1984, 5, 18).

Fruits afforded taraxerone, taraxerol and 24(R)-24-ethylcholest-5-en-3 β -ol glucoside (*J. Indian Chem. Soc.* 1987, 64, 776).

C. indica W. & A.; see *C. grandis* (L.) Voigt

COCOLOBA (Polygonaceae)

C. excoriata L.

Taraxerone, lupeol, betulinic acid and ursolic acid isolated from bark; friedelin from leaves and lupeol acetate from bark also isolated (*Fitoterapia* 1986, 57, 445).

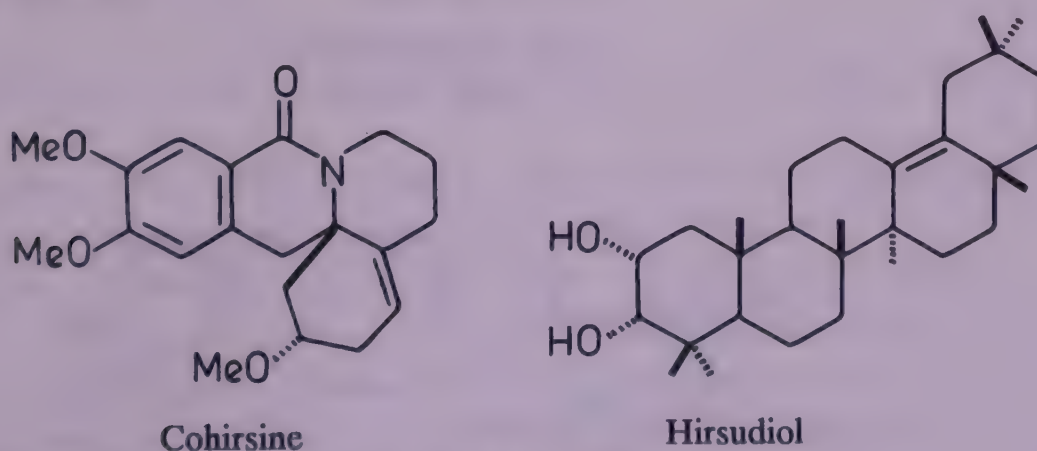
Distribution : Grown in gardens.

COCULUS (Menispermaceae)

C. hirsutus (L.) Diels syn. *C. villosus* (Lamk.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 186).

Isolation of trilobine, isotrilobine, (+)syringaresinol and protoquercitol from leaves (*J. Chem. Soc. Pak.* 1986, 8, 537; *Chem. Abstr.* 1987, 106, 99448 u); new triterpenoid alcohol - hirsudiol - isolated and its structure determined; nonacosan-10-ol also isolated (*Phytochemistry* 1987, 26, 793); isolation of novel alkaloid - cohirsine - and determination of its structure and stereostructure by 2D NOESY and NOE difference measurements (*Tetrahedron* 1987, 43, 5865).

NEW COMPOUNDS



C. laeba (Delile) DC.; see *C. pendulus* (J.R. & G. Forst.) Diels

C. laurifolius DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 186).

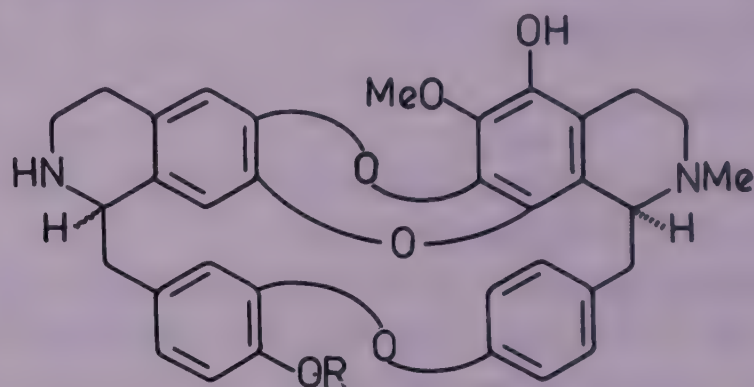
Erythlaurine, erythramide, stepholidine and O-methylflavinantine isolated from leaves (*Yakugaku Zasshi* 1984, 104, 946; *Chem. Abstr.* 1985, 102, 21195 g); synthesis of laurifonine and laurifine (*Heterocycles* 1985, 23, 1451); coccuvanine and coccoline synthesized (*Can. J. Chem.* 1987, 65, 94).

C. macrocarpus W. & A.; see *Diploclisia glaucescens* (Bl.) Diels

C. pendulus (J.R. & G. Forst.) Diels syn. *C. laeba* (Delile) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 188).

Eight new bisbenzylisoquinoline alkaloids - (+)kohatamine, (+)1,2-dehydrokohatamine, (+)1,2-dehydrokohatamine, (+)5'-hydroxyapateline, (+)5'-hydroxytelobine, (+)1,2-dehydro-2'-nortelobine, (+)siddiquine and (+)siddiquamine isolated from leaves (*Phytochemistry* 1987, 26, 829).

NEW COMPOUNDS



(+)Kohatamine

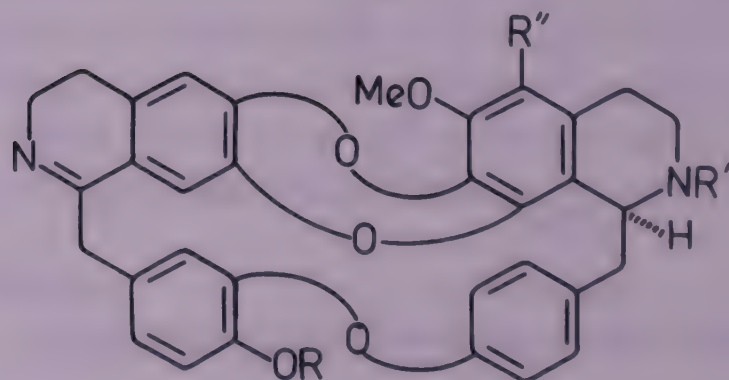
~~ = β , R = Me

(+)5'-Hydroxyapateline

~~ = α , R = H

(+)5'-Hydroxytelobine

~~ = α , R = Me



(+)1,2-Dehydrokohatamine

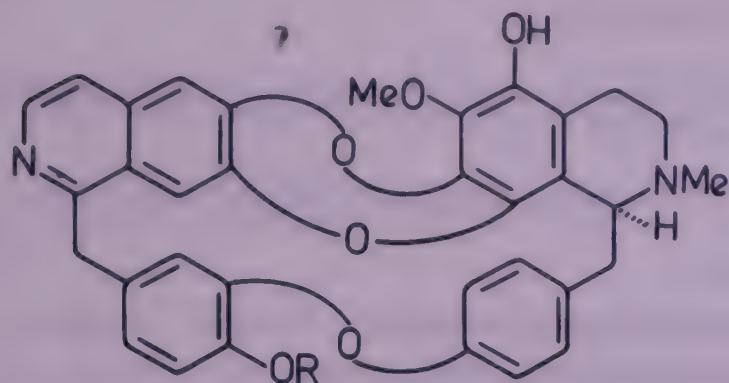
R = H, R' = Me, R'' = OH

(+)1,2-Dehydrokohatamine

R, R' = Me, R'' = OH

(+)1,2-Dehydro-2'-nortelobine

R = Me, R', R'' = H



(+)Siddiquinine

R = H

(+)Siddiquamine

R = Me

C. villosus (Lamk.) DC.; see *C. hirsutus* (L.) Diels

COCHLOSPERMUM (Cochlospermaceae)

C. gossypium DC.; see *C. religiosum* (L.) Alston

C. religiosum (L.) Alston syn. *C. gossypium* DC. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 72).

Naringenin isolated from flowers (*Indian J. Chem.* 1985, 24B, 453).

CODIAEUM (Euphorbiaceae)

C. variegatum Blume (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 73).

Leaf extract showed antifungal activity against *Alternaria alternata* and *Fusarium oxysporum*; activity was greater in young leaves than in mature leaves.

Chlorogenic, protocatechuic, p-hydroxybenzoic, cis- and trans-p-coumaric, cis- and trans-ferulic and vanillic acids isolated from leaves; amounts of cis- and trans-p-coumaric, trans-ferulic, vanillic and protocatechuic acids were higher in mature leaves than in younger ones whereas contents of chlorogenic and p-hydroxybenzoic acids were higher in young leaves (*Curr. Sci.* 1988, 57, 502).

CODONOPSIS (Campanulaceae)

C. ovata Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 73).

Taraxerol acetate, luteolin and its 7-O-glucoside, apigenin and its 7-O-glucoside isolated (*Int. J. Crude Drug Res.* 1989, 27, 105).

COELOGYNE (Orchidaceae)

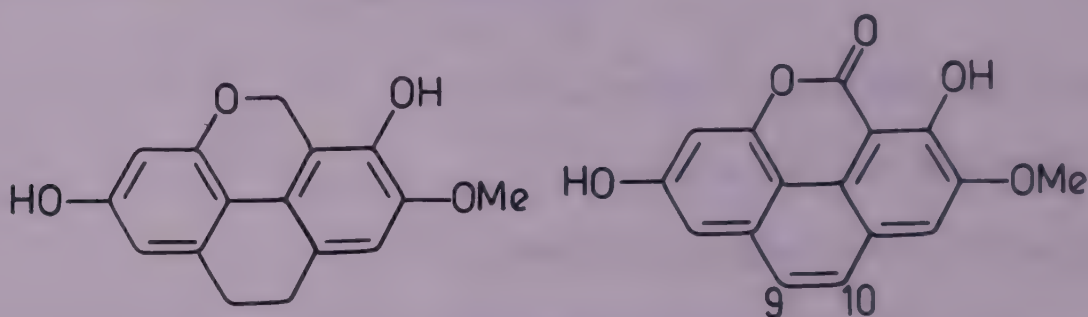
C. cristata Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 188).

Synthesis of coeloginin (*J. Chem. Soc. Perkin 1*, 1984, 1919).

C. flaccida Lindl.

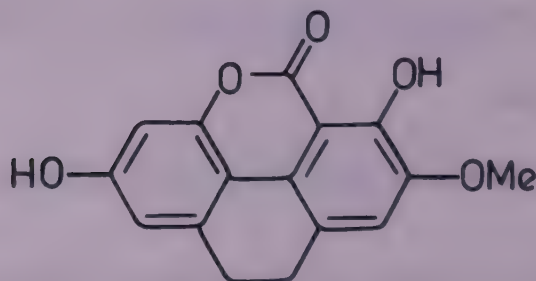
Dihydrophenanthropyran derivative - flaccidin - isolated along with imbricatin and characterised (*Phytochemistry* 1988, 27, 899; *ibid.* 1989, 28, 887); isolation and structure elucidation of flaccidin and oxoflaccidin (*Phytochemistry* 1989, 28, 887).

Distribution : Nepal and Sikkim, alt. 800-1100 m.

NEW COMPOUNDS

Flaccidin

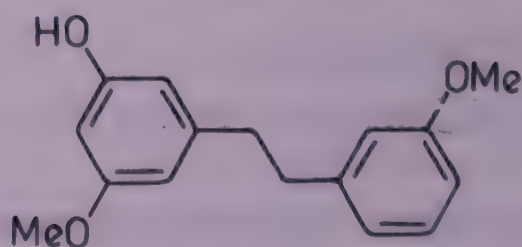
Flaccidin



Oxoflaccidin

C. ovalis Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 190).

New bibenzyl - 3'-O-methylbatatasin III - isolated together with batatasin III, coelogin, coeloginin, flavidin, flavidinin and imbricatin (*Phytochemistry* 1986, 25, 499).

NEW COMPOUNDS

3'-O-Methylbatatasin III

COFFEA (Rubiaceae)

C. arabica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 190).

Total synthesis of cafestol (*J. Am. Chem. Soc.* 1987, 109, 4717).

BIOLOGICAL ACTIVITY

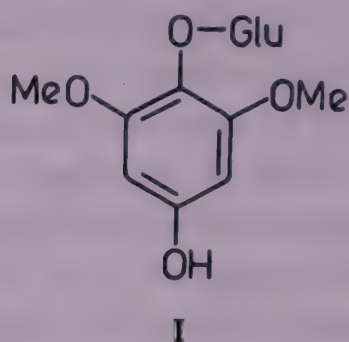
Caffeine at 0.2, 0.1 or 0.05 x LD₅₀, p.o., for 7 consecutive days caused dose-dependent reduction of viability of bone marrow cells of mice both *in vivo* and *in vitro*. At higher dose decrease in lymphocyte count and increase in number of granulocytes in peripheral blood observed (*Indian J. Exp. Biol.* 1984, 22, 608); pretreatment of rats with caffeine at a dose that did not alter basal mean arterial blood pressure, inhibited hypotensive action of propranolol; this inhibition was reversible and its onset and duration of action were 10 and 50 min respectively (*West Indian Med. J.* 1985, 34, 234; *Chem. Abstr.* 1986, 104, 81534 t); acute and chronic intravenous administration of caffeine (10.0 mg/kg) to naive rats induced widespread increase in local cerebral glucose utilization mainly in striatal and related areas (*Eur. J. Pharmacol.* 1986, 129, 93); low dose of caffeine (20.0 mg/kg, i.p.) potentiated locomotor activity induced by cocaine (2.5 mg/kg, i.v.) but higher doses (50.0 mg/kg, i.p.) had no significant effect (*Pharmacol. Biochem. Behav.* 1986, 24, 761; *Chem. Abstr.* 1986, 104, 161569 y); caffeine antagonised muscle relaxation action of diazepam and inhibitory effect of diazepam on pentylenetetrazole-induced convulsion in mice. Dorsal root reflex potentials in spinal cats inhibited by caffeine (*Nippon Yakurigaku Zasshi* 1988, 91, 181; *Chem. Abstr.* 1988, 108, 198329 d); caffeine not only increased sperm velocity but also increased percentage of motile sperms (*Fertil. Steril.* 1987, 48, 891; *Chem. Abstr.* 1988, 108, 31935 m); caffeine (0.5-10.0 mM) relaxed sustained contractions induced by 65.4 mM KCl or 1.0 μ M noradrenaline in vascular smooth muscle of rabbit aorta and intestinal smooth muscle of taenia from guinea pig caecum. It had multiple sites of action in smooth muscle; it released Ca²⁺ which was not sensitive to noradrenaline but inhibited noradrenaline-induced Ca²⁺ release (*Brit. J. Pharmacol.* 1988, 93, 267); caffeine at < 5.0 mM potentiated twitch and tetanic force in both soleus (slow-twitch) and extensor digitorum longus (fast-twitch) muscles of rat, primarily by increasing both basal and stimulus-evoked release of Ca²⁺ from sarcoplasmic reticulum (*J. Physiol.* 1989, 416, 435; *Chem. Abstr.* 1989, 111, 126829 f); administration of single dose of caffeine and nicotine (25.0 mg/kg each, i.v.) to rat on gestational day 6 and evaluation of fetal skeletal system on gestational day 20, revealed decrease in number of complete sternal ossification centres, as well as delays in ossification of skull and face, indicating a coteratogenic effect of nicotine and caffeine (*Anat. Anz.* 1989, 168, 109; *Chem. Abstr.* 1989, 111, 108972 t); caffeine (40.0 mg/kg, i.p.) had anxiogenic-like effects. Caffeine and yohimbine antagonised each other in social interaction and elevated plus-maze tests (*Eur. J. Pharmacol.* 1989, 159, 211).

COIX (Poaceae)

C. lacryma-jobi L. var. *ma-yuen* (Romanet) Stapf ex Hook.f.

Three glycans - coixans A, B and C - isolated from seeds and characterised (*Planta Med.* 1986, 52, 64); 4-ketopinoresinol, threo- and erythro-1-C-syringyl glycerol and 2,6-dimethoxy-p-hydroxyquinone-1-O- β -D-glucopyranoside (I) isolated from roots together with adenosine; new compounds characterised (*Phytochemistry* 1989, 28, 883).

Distribution : Meghalaya and Sikkim, ascending to 1500 m in hills.

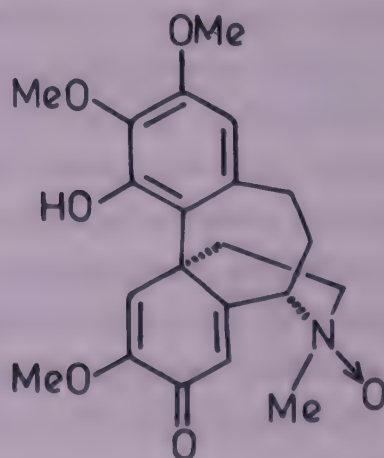
NEW COMPOUNDS**BIOLOGICAL ACTIVITY**

Coixans A, B and C exhibited hypoglycaemic activity in normal and alloxan-treated mice (*Planta Med.* 1986, 52, 64).

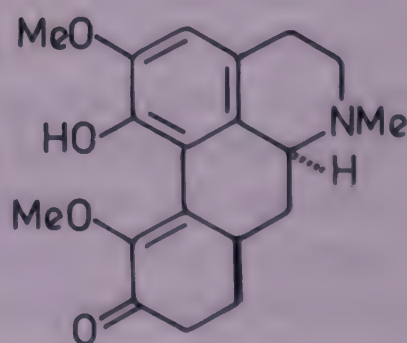
COLCHICUM (Liliaceae)

C. luteum Baker (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 192).

Total synthesis of colchicine (*J. Org. Chem.* 1985, 50, 3425); new alkaloid - collutine N-oxide - isolated and characterised (*Khim. Prir. Soedin.* 1985, 810; *Chem. Abstr.* 1986, 105, 187563 n); structure of luteidine revised by X-ray analysis (*Khim. Prir. Soedin.* 1985, 810; *Chem. Abstr.* 1986, 105, 187563 n; *Khim. Prir. Soedin.* 1986, 348; *Chem. Abstr.* 1987, 107, 40147 n).

NEW COMPOUNDS

Collutine N-oxide



Luteidine

BIOLOGICAL ACTIVITY

Colchicine inhibited delayed type hypersensitivity response of mice to sheep red blood cells; it also inhibited production of leukocyte migration inhibitory factor from spleen cells as well as migration of normal chicken peripheral lymphocytes (*Taehan Uihak Hyophoe Chapchi* 1987, 30, 409; *Chem. Abstr.* 1987, 107, 228670 g).

COLEUS (Lamiaceae)

C. amboinicus Lour. syn. *C. aromaticus* Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 194).

Estimation of carvacrol (40.40), limonene (10.58), thymol (8.12), eugenol (7.35), ethyl salicylate (5.50), γ -terpinene (3.58), β -selinene (1.38), p-cymene (1.15), α -pinene (0.46), β -caryophyllene (0.43), myrcene (0.17), β -pinene (0.11) and an unidentified phenolic fraction (4.25) in essential oil (0.1%) from Pakistani plant (*Pakistan J. Sci. Ind. Res.* 1985, 28, 10; *Chem. Abstr.* 1985, 103, 3760 d); p-cymene, terpinen-4-ol, thymol, caryophyllene, verbenone and tert-butylanisole detected in essential oil of Pakistani plant by GC-MS (*J. Chem. Soc. Pak.* 1988, 10, 369; *Chem. Abstr.* 1989, 110, 72500 a).

C. aromaticus Benth.; see *C. amboinicus* Lour.

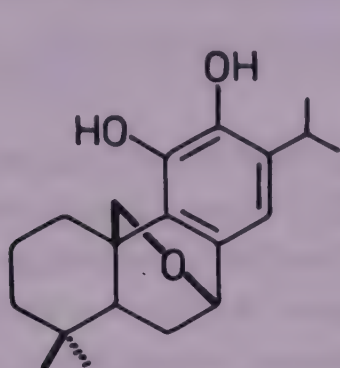
C. barbatus (Andr.) Benth.; see *C. forskohlii* (Willd.) Briq.

C. forskohlii (Willd.) Briq. syn. *C. barbatus* (Andr.) Benth., *Plectranthus barbatus* Andr. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 194).

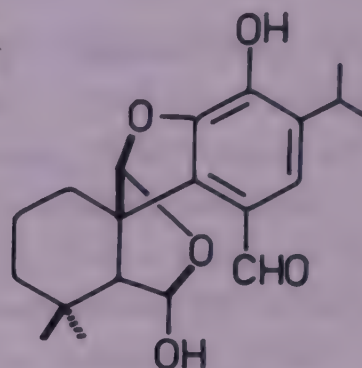
A new abietane diterpene - 20-deoxocarnosol - isolated from stems and its structure and absolute configuration determined (*Phytochemistry* 1984, 23, 1677; *An. Acad. Bras. Cienc.* 1986, 58, 53; *Chem. Abstr.* 1987, 107, 23529 w); isolation of a new seco-abietane diterpene - cariocol - and its structure determination (*Tetrahedron Lett.* 1985, 26, 3659); α -thujene, α - and β -pinenes, camphene, myrcene, 3-nonanone, p-cymene, β -phellandrene, 3-decanone, α -copaene, bornyl acetate, humulene, α -cis-bergamotene, α -curcumene, γ -curcumene, β -bisabolene, β -elemene, δ -selinene, cuparene and α - and β -ionones identified in roots (*Fitoterapia* 1986, 57, 299); new diterpenoids - 16(R)plectrinon A and plectrinon B - isolated from leaves along with coleon E, coleon F, plectrin and allylroyleanone; absolute configuration of 2-hydroxypropyl group in coleon E was established as R (*Helv. Chim. Acta* 1986, 69, 972); stereochemistry of hydroxyl group in 6-hydroxycarnosol revised as 6 α instead of 6 β as assigned earlier (*An. Acad. Bras. Cienc.* 1987, 58, 369; *Chem. Abstr.* 1988, 109, 110682 a); total synthesis of barbatusol (*Tetrahedron* 1987, 43, 5775); two new 6,7-seco-abietane diterpenes (I and II) isolated and their structures elucidated (*Phytochemistry* 1987, 26, 2337); a stereoselective synthesis of forskolin (*Tetrahedron Lett.* 1987, 28, 19; *Eur. J. Org. Chem.* 1987, 243, 646 (1987) Nov. 04; *Chem. Abstr.* 1988, 109, 38004 m; *J. Am. Chem. Soc.* 1988, 110, 3670); coleonol E (1,9-dideoxyforskolin)

isolated from roots (U.S. 4,724,238 (1988) Feb. 09; *Chem. Abstr.* 1989, 110, 147859 k); isolation, characterisation and synthesis of 1-deoxyforskolin (*Tetrahedron* 1989, 45, 763); four diterpenoids - 8,13-epoxylabd-14-en-11-one and its 6β -hydroxy, $6\beta,7\beta,9\alpha$ -trihydroxy and 7β -acetoxy- $6\beta,9\alpha$ -dihydroxy derivatives - isolated from roots and characterised (*Phytochemistry* 1989, 28, 859).

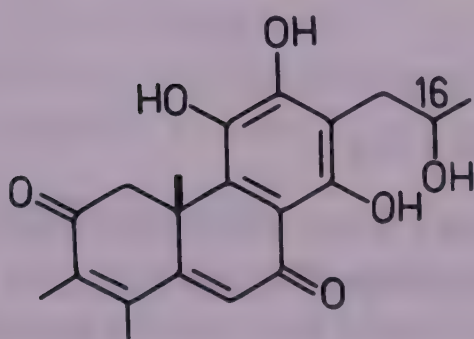
NEW COMPOUNDS



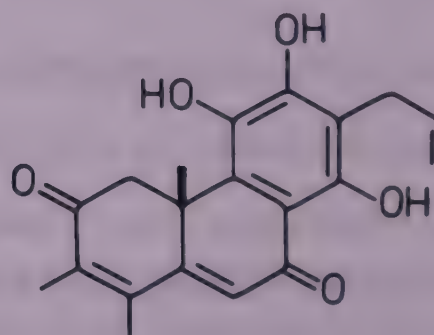
20-Deoxocarnosol



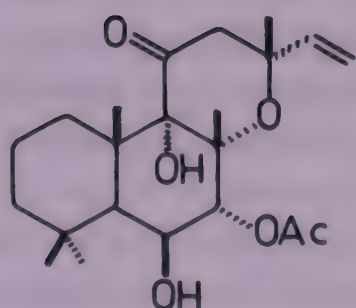
Cariocal



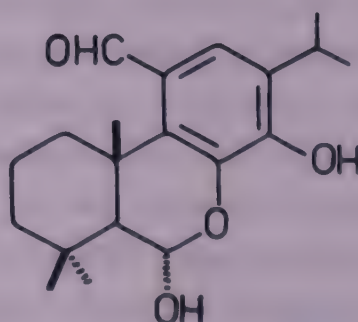
16(R)Plectrinon A



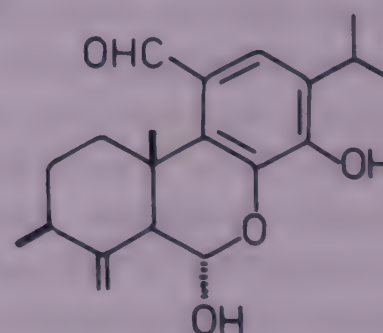
Plectrinon B



1-Deoxyforskolin



I



II

BIOLOGICAL ACTIVITY

Forskolin showed positive inotropic and chronotropic effects on isolated spontaneously-beating guinea pig atrium (*C.R. Seances Soc. Biol. Fil.* 1985, 179, 777; *Chem. Abstr.* 1986, 104, 179938 c). Forskolin ($0.1 \mu\text{M}$) reduced amplitude of spontaneous contractions in myometrial strips from pregnant rats by decreasing frequency of action potential discharge without change in resting potential or cAMP accumulation. At $1.0 \mu\text{M}$ it abolished contractions and

action potentials, hyperpolarised the membrane and increased cAMP accumulation (*Eur. J. Pharmacol.* 1986, 122, 29); forskolin (0.26-1.82 μM) produced concentration-dependent increase in tension developed (Td) and, to a lesser extent, in the maximum rate of rise in tension (dT/dt max) on isolated hemidiaphragm of rat during direct electrical stimulation. In calcium-free medium, effects of forskolin on Td and dT/dt max were weaker than in calcium-containing medium. Thus, forskolin increases isometric contraction of isolated hemidiaphragm by activating cAMP-generating system in presence of calcium (*Brit. J. Pharmacol.* 1986, 88, 791); sustained contraction in rabbit aorta induced by norepinephrine was inhibited by 10.0 nM to 10.0 μM forskolin in concentration-dependent manner. It also inhibited contraction induced by norepinephrine in Ca^{2+} -free solution. Forskolin inhibited increase in Ca^{2+} influx due to norepinephrine, but not that due to high K^{+} . Caffeine-induced transient contraction was not inhibited by 10.0 μM forskolin. It inhibited Ca^{2+} release induced by norepinephrine, but not that by caffeine. Forskolin increased tissue cAMP content in resting, norepinephrine-treated aorta (*Jap. J. Pharmacol.* 1988, 46, 293); in anaesthetised rabbits forskolin (10.0 $\mu\text{g/kg}$ per min) increased blood flow in cerebrum and increased flow to myocardium and kidney despite decrease in mean arterial pressure. Forskolin did not alter cerebral oxygen consumption (*Stroke* 1986, 17, 1299; *Chem. Abstr.* 1987, 107, 126829 y); forskolin at minimum concentration (2.0 to 20.0 nM) increased heart rate, left ventricular pressure and tissue level of cAMP in concentration-dependent manner in isolated perfused rat and guinea pig heart. In both species, maximal effects observed with 2.0 μM forskolin. Increase in cAMP was greater in rat heart than in guinea pig heart at any concentration (*Can. J. Cardiol.* 1985, 1, 385; *Chem. Abstr.* 1986, 104, 122803 a).

Forskolin (1.0-100.0 μM), a direct activator of adenylate cyclase, elevated intracellular cAMP levels in dose-dependent manner; at lower concentration it markedly stimulated spontaneous PGE₂ production in isolated renal arteries of dog which was the result of a cAMP-independent action of forskolin, possibly related to activation of PGE₂ isomerase (*Jap. J. Pharmacol.* 1985, 39, 99); effect of forskolin, added either before or 5 min after onset of potassium-evoked release of vasopressin from isolated neurointermediate lobes of rat, determined. Forskolin (1.0 μM) added before stimulation enhanced potassium-evoked release of vasopressin throughout two successive 5 min periods of stimulation, but a higher concentration (10.0- 80.0 μM) produced no effect during first 5 min of stimulation but inhibited release during second 5 min period. When added 5 min after onset of potassium stimulation, it (1.0-80.0 μM) reduced amount of vasopressin released during the remaining 5 min of stimulation. Forskolin produced concentration-dependent increase in cAMP during both the control and potassium stimulation periods (*Brit. J. Pharmacol.* 1985, 85, 197).

Intra-arterial injection of forskolin (10.0 to 333.0 μg) into cat nictitating membrane (CNM) preparation produced dose-related inhibition of contractions elicited by electrical stimulation of pre- and post-ganglionic sympathetic neurons. Forskolin (0.5 mg) lowered intraocular

pressure in rabbits and suppressed contraction of electrically-stimulated CNM, partly by inhibiting sympathetic neuronal function (*Curr. Eye Res.* 1985, 4, 87; *Chem. Abstr.* 1985, 102, 143165 t); single instillation of forskolin (1.0%) showed no effect on intraocular pressure but instillations at an interval of 5 min, lowered it in normal volunteers after 1 hr (*Atarashii Ganka* 1986, 3, 537; *Chem. Abstr.* 1986, 105, 127424 h); forskolin eye drops lowered intraocular pressure in healthy volunteers (*SAMJ* 1987, 71, 570; *Chem. Abstr.* 1987, 107, 127110 u).

Forskolin stimulated stomach acid secretion in isolated guinea pig parietal cells, anaesthetised rats and in dogs (*IRCS Med. Sci.* 1985, 13, 38; *Chem. Abstr.* 1985, 102, 106290 j); forskolin (0.1-1.0 mg/kg, i.v.) caused a dose-dependent stimulation of acid secretion in anaesthetised rats. Higher doses were not tolerated; stimulating effect of combined infusion with histamine or carbachol on acid secretion also studied (*Eur. J. Pharmacol.* 1986, 125, 233).

Forskolin induced maximum immuno-stimulant activity at 5.0 mg/kg dose in female mice (*Eur.* 126,313 (1984) Nov. 28; *Chem. Abstr.* 1985, 102, 100797 h). Forskolin (0.5-10.0 μ M) caused hyperpolarisation and relaxation of smooth muscle cells of guinea pig taenia caeci (*Eur. J. Pharmacol.* 1984, 106, 181); inhibitory effects of forskolin on nerve conduction determined in de-sheathed sciatic nerve preparation of frog. It (2.5 μ M) caused 50.0% decrease in amplitude of action potentials when nerve conduction was partially blocked by tetrodotoxin (*Brit. J. Pharmacol.* 1985, 85, 309); forskolin at 25.78 μ g increased percentage of motile spermatozoa in bull (*Andrologia* 1989, 21, 293; *Chem. Abstr.* 1989, 111, 127002 t); forskolin induced partial deaggregation of ADP- or collagen-aggregated human platelets *in vitro*, which was assumed to be due to increase in platelet cAMP by forskolin (*Naunyn-Schmiedeberg's Arch. Pharmacol.* 1985, 331, 119; *Chem. Abstr.* 1986, 104, 102237 r); 1,9-dideoxyforskolin showed anti-inflammatory activity in carrageenin-induced rat paw oedema (ED₅₀ 2.2 mg/kg, i.p.) (U.S. 4,724,238 (1988) Feb. 09; *Chem. Abstr.* 1989, 110, 147859 k).

COLOCYNTHIS (Cucurbitaceae)

C. vulgaris Schrad.; see *Citrullus colocynthis* (L.) Schrad.

COLYSIS (Polypodiaceae)

C. hemionitidea (Wall. ex Mett.) Presl syn. *Pleopeltis hemionitidea* (Wall. ex Mett.) Moore

Uracil (1.6) and uridine (1.3%) isolated from fronds (*Yakugaku Zasshi* 1985, 105, 655; *Chem. Abstr.* 1985, 103, 157319 d).

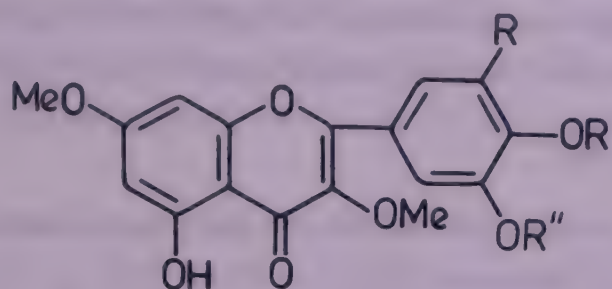
Distribution : Throughout mountainous regions of India, Nepal and Bhutan.

COMBRETUM (Combretaceae)

C. quadrangulare Kurz (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 118).

Combretol, ayanin and compound I isolated from flowers; compound I obtained as a mixture of two polymorphic forms (α and β) which were characterised by X-ray studies (*Aust. J. Chem.* 1985, 38, 1177).

NEW COMPOUNDS



| | R | R' | R'' |
|------------|-----|----|-----|
| Combretol | OMe | Me | Me |
| Ayanin | H | Me | H |
| Compound I | OMe | H | Me |

COMMIPHORA (Burseraceae)

C. mukul (Hook. ex Stocks) Engl.; see *C. wightii* (Arnott) Bhandari

C. wightii (Arnott) Bhandari syn. *C. mukul* (Hook. ex Stocks) Engl., *Balsamodendron mukul* Hook. ex Stocks (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 197).

Crystal structure of cembrene determined (*Jilin Daxue Ziran Kexue Xuebao* 1986, 98; *Chem. Abstr.* 1987, 107, 40128 g).

BIOLOGICAL ACTIVITY

A double blind clinical trial of fraction A of guggulu oleo-resin conducted on 84 obese subjects revealed that it was a potent hypolipidaemic agent which reduced serum cholesterol, total lipids and triglycerides significantly. Not much effect was seen on body weight and skinfolds except for triceps skinfold which was reduced significantly (*J. Res. Ayurveda & Siddha* 1985, 6, 20); phase I clinical trial of guggulipid on 21 patients at dose of 400.0 mg (tds) for 4 weeks showed it to be completely safe and devoid of any effect on liver function, blood sugar and blood urea levels. In phase II clinical trial, guggulipid was evaluated in 19 patients (13 males and 6 females, age from 30 to 65 yr) of primary hyperlipidaemia. It was given 500.0 mg (tds) for 12 weeks, following 6 weeks of dietary control, and patients were followed up at 4-week intervals. Cholesterol and triglycerides were significantly lowered in 15 patients (76.9%). Average lowering in responder group for cholesterol was 17.5% and for triglycerides 30.3% (*Indian J. Med. Res.* 1986, 84, 626); serum cholesterol decreased by 7.8, 15.78 and 27.75% at the end of 4th, 8th and 16th week, respectively in drug-treated (purified gum 4.5 g,

daily) hyperlipidaemic patients. Serum triglyceride levels also decreased by 6.7, 17.1 and 27.1% at the end of 4th, 8th and 16th week. HDL cholesterol showed a gradual increase to 35.8% at the end of 16 weeks. VLDL and LDL cholesterol showed significant decrease during this period. The drug was found to be safe and highly effective in lowering various lipid fractions known to be atherogenic and in raising HDL cholesterol significantly (*Indian J. Med. Res.* 1988, 87, 356); review on pharmacology of gum guggul (*Indian J. Med. Res.* 1988, 87, 327).

CONSOLIDA (Ranunculaceae)

C. ambigua (L.) Ball. & Heywood syn. *Delphinium ajacis* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 198).

14-Deacetylajadine isolated and its structure elucidated (*J. Nat. Prod.* 1989, 52, 143).

BIOLOGICAL ACTIVITY

Delsoline (1.25 and 2.5 mg/kg, i.p.) lowered blood pressure in anaesthetised dogs by 30.0 and 47.0% respectively. It produced negative inotropic effect on isolated heart. It showed ganglion-blocking and curare-like activity in dogs and rabbits respectively. Its i.v. administration decreased vascular resistance in dogs (*Zhongguo Yaoli Xuebao* 1985, 6, 37; *Chem. Abstr.* 1985, 102, 178898 m).

CONVOLVULUS (Convolvulaceae)

C. microphyllus Sieb. ex Spreng. syn. *C. pluricaulis* Choisy (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 207).

n-Tetracontane, n-octacosanol and β -sitosterol isolated (*Curr. Sci.* 1986, 55, 917).

C. pluricaulis Choisy; see *C. microphyllus* Sieb. ex Spreng.

CONYZA (Asteraceae)

C. aegyptiaca Ait. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 208).

α -Curcumene, germacrene D, β -farnesene, caryophyllene epoxide, stigmasterol, lachnophyllum ester, squalene, matricaria ester and an acetylenic lactone isolated from aerial parts (*Pharmazie* 1984, 39, 575; *Chem. Abstr.* 1985, 102, 21259 f).

C. ambigua DC.; see *C. bonariensis* (L.) Cronq.

C. bonariensis (L.) Cronq. syn. *Erigeron linifolius* Willd., *Conyza ambigua* DC.

Essential oil exhibited antimicrobial activity due to high content of lachnophyllum ester (*Fitoterapia* 1986, 57, 272).

Cis-lachnophyllum ester (64.04%) found to be major constituent along with α - and β -pinenes, camphene, β -phellandrene, p-cymene, cis- and trans-linalool oxides, linalool, β -ionone, γ -elemene, β -caryophyllene, γ -cadinene, lachnophyllum lactone, cyclopentane-propionic acid-2-oxo-methylester and 2-ethylphenol in oil by GC/MS (*Fitoterapia* 1986, 57, 272); caffeic acid, apigenin, chrysoeriol, luteolin, dihydrosinapyl alcohol, acacetin, chlorogenic acid, neo-chlorogenic acid, cynarin, 3,4-, 3,5- and 4,5-dicaffeoylquinic acids, scopoletin and quercetin-3-glucoside isolated from aerial parts (*Rev. Latinoam. Quim.* 1988, 19, 141; *Chem. Abstr.* 1989, 110, 92112 d).

Distribution : Throughout plains of India, also as garden weed.

C. canadensis (L.) Cronq. syn. *Erigeron canadensis* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 199).

Extract of aerial parts exhibited significant anti-inflammatory activity in carrageenin- and formalin-induced oedema in rats (*Pharmazie* 1986, 41, 268; *Chem. Abstr.* 1986, 105, 39427 f).

α -Spinasterol, stigmast-7-en-3 β -ol, stigmasta-7,22-dien-3-one and stigmast-7-en-3-one isolated (*J. Indian Chem. Soc.* 1985, 62, 78); apigenin, luteolin, kaempferol, quercetin and their glycosides and ferulic, caffeic, p-coumaric, chlorogenic, syringic, protocatechuic, vanillic, succinic and p-hydroxybenzoic acids as well as α -spinasterol and β -sitosterol isolated (*Cesk. Farm.* 1985, 34, 209; *Chem. Abstr.* 1985, 103, 115572 a; *Acta Pol. Pharm.* 1987, 44, 476; *Chem. Abstr.* 1988, 109, 51736 w); isolation of β -santalene, β -himachalene, cuparene, α -curcumene and γ -cadinene from aerial parts (*Pharmazie* 1986, 41, 286; *Chem. Abstr.* 1986, 105, 39427 f).

C. leucantha (D.Don) Ludlow & Raven syn. *C. viscidula* Wall. ex DC. *Blumea leucanthema* DC.

β -Pinene (32.0), limonene (29.0), β -caryophyllene (6.0), α -pinene (5.6) and myrtenol (1.35%) determined in flower oil by GC/MS whereas oil from leaves contained limonene (26.0), α -bergamotene (5.5), β -bergamotene (10.4), β -caryophyllene (9.6), sabinene (6.96) and myrtenol (2.76%) (*Fitoterapia* 1987, 58, 419).

Distribution : Himalayas from Himachal Pradesh eastwards and peninsular India, ascending to 1200 m in hills.

C. viscidula Wall. ex DC.; see *C. leucantha* (D.Don) Ludlow & Raven

COPTIS (Ranunculaceae)

C. ospricarpa Bruhl; see *Souliea vaginata* (Maxim.) Franch.

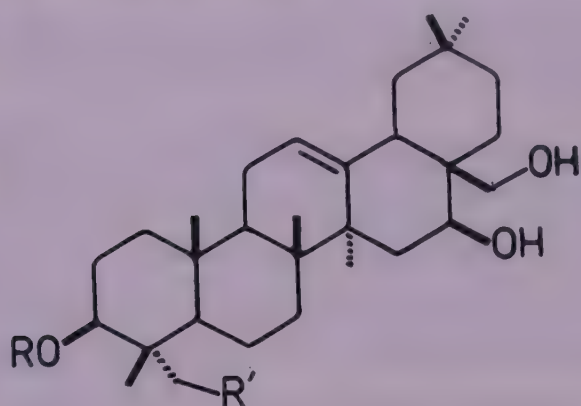
CORCHORUS (Tiliaceae)

C. acutangulus Lam.; see *C. aestuans* L.

C. aestuans L. syn. *C. acutangulus* Lam. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 208).

Four new triterpenoid glycosides - corchorusins A, B, C and D - isolated from aerial parts and characterised as longispinogenin-3-O- β -D-galactopyranoside, saikogenin F-3-O- β -D-galactopyranoside, 23-hydroxylongispinogenin-3-O- β -D-galactopyranoside and saikogenin E-3-O- β -D-glucopyranoside(1 \rightarrow 2)- β -D-galactopyranoside respectively (*J. Chem. Soc. Perkin 1*, 1987, 629); corchorusins C1, D1, D2 and D3 isolated from aerial parts and their structures elucidated (*Phytochemistry* 1988, 27, 1433).

NEW COMPOUNDS



Corchorusin A

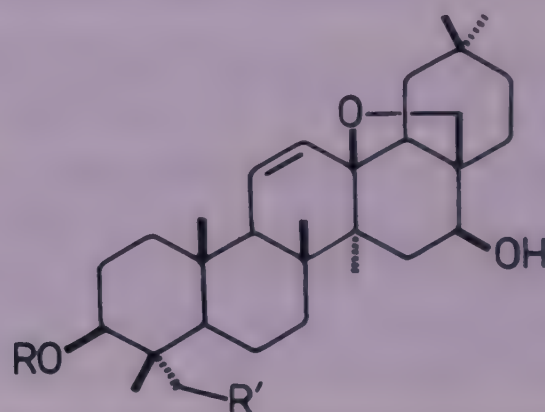
R = Gal, R' = H

Corchorusin C

R = Gal, R' = OH

Corchorusin D2

R = Gal(2 \rightarrow 1)Glu, R' = H

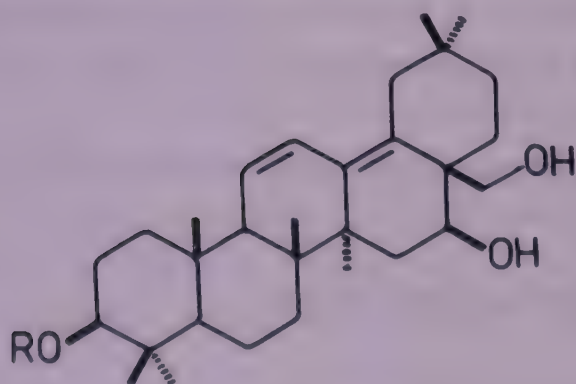


Corchorusin B

R = Gal, R' = OH

Corchorusin D

R = Gal(2 \rightarrow 1)Glu, R' = H

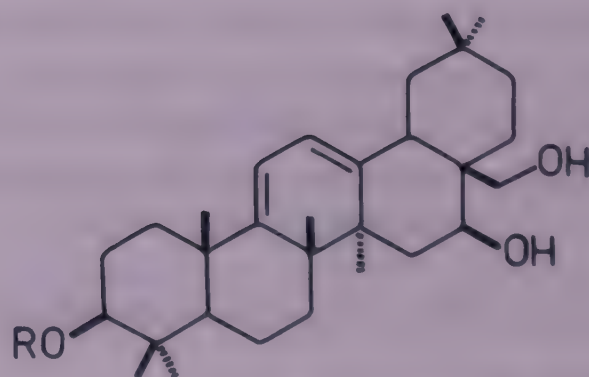


Corchorusin C1

R = Gal

Corchorusin D3

R = Gal(2 \rightarrow 1)Glu



Corchorusin D1

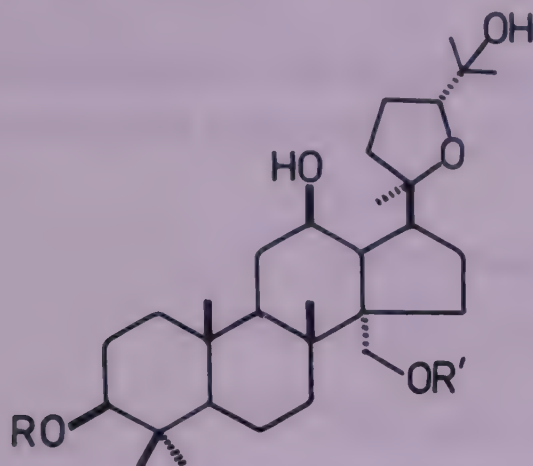
R = Gal(2 \rightarrow 1)Glu

C. antichorus Raeusch.; see *C. depressus* (L.) Stocks

C. capsularis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 200).

A new dammarane glycoside - capsin - isolated from leaves and its structure and configuration determined (*Phytochemistry* 1984, 23, 2583); isolation of capsugenin-30-O-glucopyranoside from leaves and its characterisation (*J. Nat. Prod.* 1987, 50, 479).

NEW COMPOUNDS



Capsin

R = Glu, R' = H

Capsugenin-30-O-glucopyranoside

R = H, R' = Glu

C. depressus (L.) Stocks syn. *C. antichorus* Raeusch. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 200).

Quercetin and kaempferol isolated from leaves and flowers (*Geobios.* 1988, 15, 32; *Chem. Abstr.* 1988, 109, 89702 v).

C. olitorius L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 201).

BIOLOGICAL ACTIVITY

Effect of olitoriside (0.3 mg/kg) on regeneration of myocardial ultrastructure studied in young and adult rats with cardiomyopathy, experimentally induced by adrenaline. Myocardium of young rats had fringed myofibrils and mitochondria with homogeneous matrix and disorganised cristae (*Zdravookhr. Kirg.* 1987, 35; *Chem. Abstr.* 1988, 108, 387 e).

CORDIA (Boraginaceae)

C. angustifolia Roxb.; see *C. gharaf* (Forst.) Ehrenb. ex Asch.

C. dichotoma Forst.f. syn. *C. obliqua* Willd., *C. latifolia* Roxb., *C. myxa* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 201).

Macrophylline isolated (*Sci. Pharm.* 1987, 55, 163; *Chem. Abstr.* 1988, 108, 3451 g); β -sitosterol and α -linolenic, palmitic, linoleic and oleic acids identified in leaves (*Herba Hung.* 1989, 28, 7; *Chem. Abstr.* 1989, 111, 150585 u).

C. gharaf (Forst.) Ehrenb. ex Asch. syn. *C. rothii* Roem. & Schult., *C. angustifolia* Roxb., *C. sinensis* Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 201).

Isolation of floridanine (*Sci. Pharm.* 1987, 55, 163; *Chem. Abstr.* 1988, 108, 3451 g); identification of palmitic, linoleic and oleic acids in leaves (*Herba Hung.* 1989, 28, 7; *Chem. Abstr.* 1989, 111, 150585 u).

C. latifolia Roxb.; see *C. dichotoma* Forst.f.

C. myxa Roxb.; see *C. dichotoma* Forst.f.

C. obliqua Willd.; see *C. dichotoma* Forst.f.

C. rothii Roem. & Schult.; see *C. gharaf* (Forst.) Ehrenb. ex Asch.

C. sebestena L.

Eng. - Geigar tree, Scarlet cordia, Aloe wood.

Identification of α -linolenic, palmitic, linoleic and oleic acids and β -sitosterol in leaves (*Herba Hung.* 1989, 28, 7; *Chem. Abstr.* 1989, 111, 150585 u).

Distribution : Introduced into Indian gardens.

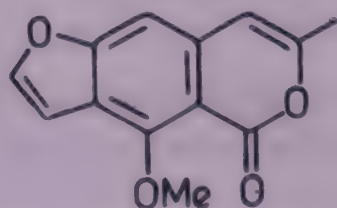
C. sinensis Lamk.; see *C. gharaf* (Forst.) Ehrenb. ex Asch.

CORIANDRUM (Apiaceae)

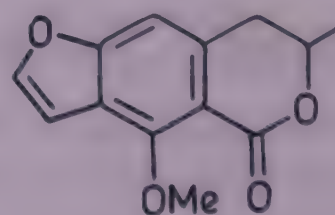
C. sativum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 201).

Gnaphaloside A, gnaphaloside B, quercetin, isorhamnetin, rutin and luteolin isolated from fruits (*Farmatsiya* 1986, 35, 46; *Chem. Abstr.* 1986, 105, 102403 n); two new furoisocoumarins - coriandrin and dihydrocoriandrin - isolated and characterised by X-ray analysis (*Phytochemistry* 1988, 27, 2083).

NEW COMPOUNDS



Coriandrin



Dihydrocoriandrin

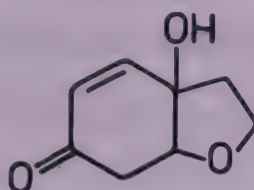
CORNUS (Cornaceae)

C. capitata Wall.; see *Benthamidia capitata* (Wall.) Hara

C. controversa Hemsley ex Prain syn. *C. macrophylla* sensu Hook.f. p.p.
Assam - Dieng-phait.

Halleridone isolated (*J. Nat. Prod.* 1988, 51, 1281).

Distribution : North Bengal, Sikkim, Bhutan, Arunachal Pradesh and Manipur.

NEW COMPOUNDS

Halleridone

BIOLOGICAL ACTIVITY

Halleridone exhibited cytotoxic activity against P-388 and HeLa cells (*J. Nat. Prod.* 1988, 51, 1281).

Note : *C. macrophylla* (Fl. Brit. India, II, 744) is a mixture of two taxa viz *C. macrophylla* Wall. and *C. controversa* Hemsley ex Prain. The former occurs in north-western to central Himalayas and the latter in eastern Himalayas.

C. macrophylla Hook.f.; see *C. controversa* Hemsley ex Prain

CORONOPUS (Brassicaceae)

C. didymus (L.) Smith syn. *Senebiera didyma* (L.) Pers., *S. pinnatifida* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 202).

Benzyl nitrile (87.3), n-tetradecane (1.1), n-pentadecane (1.3), n-hexadecane (1.5) and n-heptadecane (1.2%) identified in seed essential oil (*J. Chem. Soc. Pak.* 1989, 11, 80; *Chem. Abstr.* 1989, 111, 191497 k).

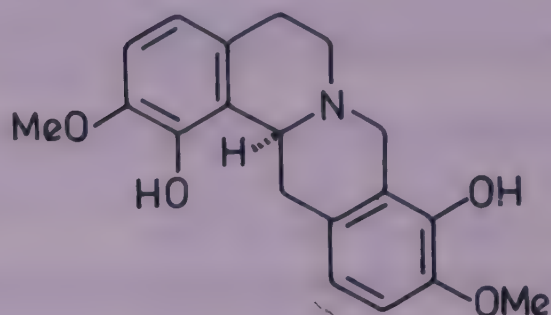
CORYDALIS (Fumariaceae)

C. clarkei Prain syn. *C. moorcroftiana* Wall. ex Hook.f. & Thoms., p.p., *C. elegans* sensu Hook.f., p.p. (non Wall. ex Hook.f. & Thoms.)

A new alkaloid - clarkeanidine - along with caseanadine isolated and its structure established (*J. Nat. Prod.* 1985, 48, 802).

Distribution : Kashmir and Ladakh, alt. 3600-4500 m.

NEW COMPOUNDS



Clarkeanidine

C. elegans Wall. ex Hook.f. & Thoms.; see *C. clarkei* Prain

C. govaniana Wall. var. *govaniana* (Compend. Indian Med. Plants, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 213).

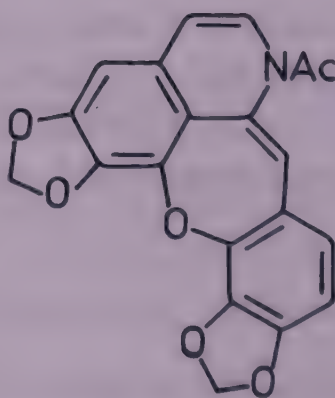
Govadine, govanine, corygovanine and bicuculline isolated from leaves and stems (*J. Indian Chem. Soc.* 1984, 61, 1016); protopine, ochotensine, 13-epiyenhusomine and isocorydine isolated; 13-epiyenhusomine was found to be identical with raddeanine (*J. Nat. Prod.* 1987, 50, 270).

C. hendersonii Hemsl. syn. *C. nepalensis* Kitamura

A new alkaloid - henderine - along with protopine, stylopine, β -allocryptopine and cheilanthifoline isolated and structure of new compound elucidated (*Zhiwu Xuebao* 1986, 28, 91; *Chem. Abstr.* 1986, 105, 3497 q).

Distribution : Kashmir and Nepal, alt. 3800-6000 m.

NEW COMPOUNDS

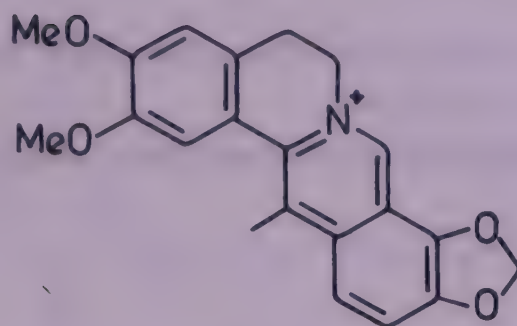


Henderine

C. meifolia Wall. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 203).

Isolation of dehydrocavidine along with (+)sinactine, cavidine, apocavidine, stylopine, cheilanthifoline, yenhusomine and protopine (*J. Indian Chem. Soc.* 1984, 61, 1016).

NEW COMPOUNDS



Dehydrocavidine

C. moorcroftiana Wall. ex Hook.f. & Thoms.; see *C. clarkei* Prain

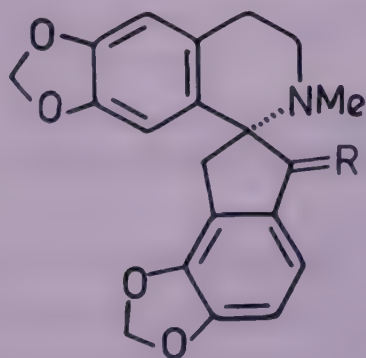
C. nepalensis Kitamura; see *C. hendersonii* Hemsl.

C. ramosa Wall.; see *C. vaginans* Royle

C. stewartii Fedde (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 214).

Two new alkaloids - (+)ochotensidine and (+)corystewartine - isolated from Pakistani plant; (+)ochotensine, (+)ochotensimine, adlumidine and domesticine also obtained (*J. Nat. Prod.* 1988, 51, 1136).

NEW COMPOUNDS



Ochotensidine

R = CH₂

(+)Corystewartine

R = α -OH, β -Me

C. stricta Steph. ex Fisch. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 203).

Alkaloid content of seeds was 1.04%. Bicuculline as major alkaloid along with (+) β -hydrastine, adlumidine, protopine, scoulerine, stylopinine, cis-N-methylstylopinium hydroxide

and pycnarrhine isolated from seeds (*Planta Med.* 1985, 51, 469); ¹³C-NMR of sanguinarine studied (*Heterocycles* 1988, 27, 911).

C. vaginans Royle syn. *C. ramosa* Wall. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 214).

(+) Adlumidine, (+) carlumine and (-) bicuculline isolated from roots (*Fitoterapia* 1987, 58, 201).

CORYLUS (Corylaceae)

C. avellana L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 124).

Quercetin-3-O-(2''-O- β -D-glucopyranosyl)- β -D-galactopyranoside isolated from pollens (*Phytochemistry* 1984, 23, 2970); (E)caffeoyl-(E)feruloylspermidine and di-(E)feruloylspermidine isolated from pollens (*Phytochemistry* 1986, 25, 433); isolation of kaempferol, quercetin, quercitrin, myricetin, myricitrin and afzelin from bark (*Khim. Prir. Soedin.* 1986, 372; *Chem. Abstr.* 1986, 105, 112083 x).

COSCINIUM (Menispermaceae)

C. fenestratum (Gaertn.) Colebr. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 203).

Berlambine, dihydroberlambine and noroxyhydrastinine isolated from roots (*Indian Drugs* 1988, 25, 350).

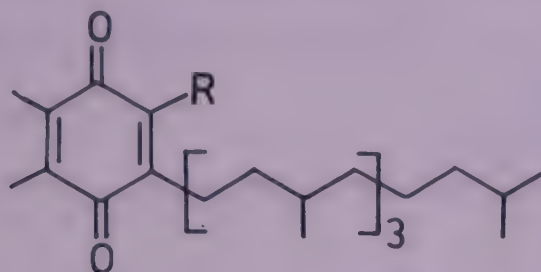
COSTUS (Zingiberaceae)

C. speciosus (Koen. ex Retz.) Sm. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 204).

Two new quinones - dihydrophytylplastoquinone and its 6-methyl derivative - along with α -tocopherolquinone and 5 α -stigmast-9(11)en-3 β -ol isolated from seeds and their structures elucidated (*Phytochemistry* 1984, 23, 1725); methyl hexadecanoate, methyl octadecanoate and tetracosanyl octadecanoate isolated from seeds (*Indian J. Pharm. Sci.* 1984, 46, 150); a tocopherol isolated from seeds and identified as G2-tocopherol (*Chem. Ind.* 1985, 56); five new compounds - tetradecyl 13-methylpentadecanoate, tetradecyl 11-methyltridecanoate, 14-oxotricosanoic acid, 14-oxoheptacosanoic acid and 15-oxooctacosanoic acid - isolated from rhizomes and characterised (*Phytochemistry* 1986, 25, 1899); seed oil (6.0%) consisted of palmitic (55.97), oleic (23.75%), linoleic, stearic, myristic and lauric acids. Defatted seeds contained diosgenin, glucose, galactose and rhamnose (*Indian For.* 1986, 112, 135; *Chem. Abstr.* 1987, 106, 99407 e); 31-norcycloartanone, cycloartanol, cycloartenol and cyclolaudenol iso-

lated from roots (*Planta Med.* 1988, 54, 268); methyl 3-(4-hydroxyphenyl)-2E-propenoate isolated from rhizomes (*Planta Med.* 1988, 54, 477).

NEW COMPOUNDS



Dihydrophytylplastoquinone

R = H

6-Methyldihydrophytylplastoquinone

R = Me

BIOLOGICAL ACTIVITY

Methyl 3-(4-hydroxyphenyl)-2E-propenoate inhibited growth of *Aspergillus niger*, *Cladosporium cladosporioides*, *Colletotrichum gloeosporioides* and *Gloeosporium mangiferae* (*Planta Med.* 1988, 54, 477).

COTINUS (Anacardiaceae)

C. coggia Scop. syn. *Rhus cotinus* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 205).

Essential oil exhibited antimicrobial activity against Gram-positive bacteria (*Herba Hung.* 1986, 25, 73; *Chem. Abstr.* 1987, 107, 151205 z).

Oil from plants harvested at different phases of development contained limonene (30.0 - 40.0), α -pinene (24.4 - 34.3), β -pinene (7.6 - 20.2), car-3-ene (4.6 - 11.0), α -terpinolene (3.3 - 10.6), myrcene (approx. 3.3), camphene (approx. 2.6) and γ -terpinene (approx. 1.0%) (*Herba Hung.* 1986, 25, 73; *Chem. Abstr.* 1987, 107, 151205 z; *Herba Hung.* 1986, 25, 135; *Chem. Abstr.* 1986, 105, 66227 x); an antihepatitis compound - fisetin - isolated from stem (*Zhongyao Tongbao* 1988, 13, 162; *Chem. Abstr.* 1988, 108, 226722 x).

COUROUPITA (Lecythidaceae)

C. guianensis Aubl. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 216).

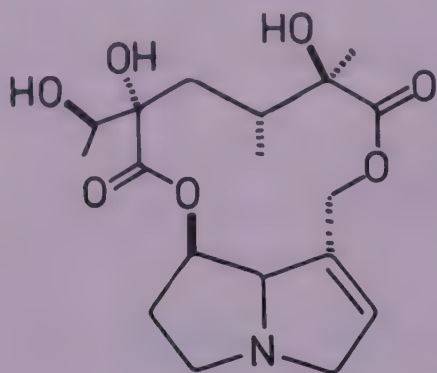
Isolation of tryptanthrin, indigo, indirubin and isatin; synthesis of tryptanthrin (*Tetrahedron* 1985, 41, 2829).

CRASSOCEPHALUM (Asteraceae)

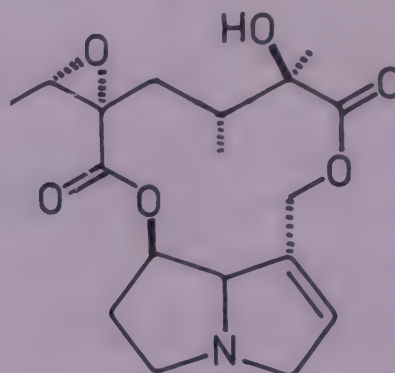
C. crepidioides (Benth.) Moore syn. *Gynura crepidioides* Benth., *Erechtites valerianifolia* sensu Fischer [non (Wolf) DC.]

Two pyrrolizidine alkaloids - jacobine and jacoline - isolated from aerial parts and characterised (*Planta Med.* 1985, 51, 539).

Distribution : Almost throughout India.

NEW COMPOUNDS

Jacoline



Jacobine

CRATAEGUS (Rosaceae)

C. oxyacantha L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 216).

Extracts of shoots, leaves and flowers given orally produced bradycardia in normal rats, lowered arterial pressure in normal and hypertensive rats and protected rats against aconitine, barium chloride and adrenaline-induced heart arrhythmias (*Plant. Med. Phytother.* 1986, 20, 37; *Chem. Abstr.* 1986, 105, 72369 m).

CRATAEVA (Capparaceae)

C. adansonii DC. ssp. *odora* (Buch.-Ham.) Jacobs syn. *C. religiosa* sensu Hook.f. & Thoms. var. *roxburghii* (R.Br.) Hook.f. & Thoms. (excl. syn. *C. unilocularis*) (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 217).

Isolation and characterisation of (-)epiafzelechin-5-glucoside from bark (*Phytochemistry* 1984, 23, 2402); lupeol, sitosterol, rutin, oleic acid and linolenic acid isolated from stem bark (*Indian Drugs* 1987, 24, 564).

C. nurvala Buch.-Ham. syn. *C. religiosa* sensu Hook.f. & Thoms. var. *nurvala* (Buch.-Ham.) Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 217).

Cadabicine and its diacetate isolated from stem bark (*J. Nat. Prod.* 1987, 50, 1186).

C. religiosa Hook.f. & Thoms. var. *nurvala* (Buch.-Ham.) Hook.f. & Thoms.; see *C. nurvala* Buch.-Ham.

C. religiosa Hook.f. & Thoms. var. *roxburghii* (R.Br.) Hook.f. & Thoms.; see *C. adansonii* DC. ssp. *odora* (Buch.-Ham.) Jacobs

CRATOXYLUM (Clusiaceae)

C. formosum (Jack) Dyer ssp. *pruniflorum* (Kurz) Gog. (*prunifolium*) syn. *C. prunifolium* (Kurz) Dyer

Quercetin, hyperoside, 1,3,6,7-tetrahydroxyxanthone, mangiferin and isomangiferin isolated from leaves (*Pharmazie* 1988, 43, 879; *Chem. Abstr.* 1989, 110, 228618 h).

Distribution : Nagaland.

C. prunifolium (Kurz) Dyer; see *C. formosum* (Jack) Dyer ssp. *pruniflorum* (Kurz) Gog.

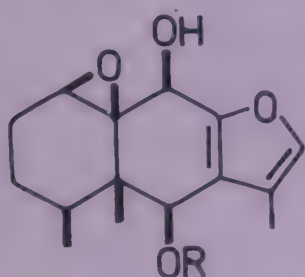
CREMANTHODIUM (Asteraceae)

C. amicoides (DC.) Good syn. *Senecio amicoides* (DC.) Clarke (non Hook. & Arn.)

6 β -Angeloyloxy and 6 β -(2-methylacryloyloxy) derivatives of 1,10 β -epoxy-9 β -hydroxy-furanoeremophilane (I, II) and 1,10 β -epoxy-furanoeremophil-9-one (III and IV) along with stigmasterol and β -sitosterol isolated from roots (*Planta Med.* 1988, 54, 188).

Distribution : Himalayas, from Garhwal to Nepal, alt. 2500-4000 m.

NEW COMPOUNDS

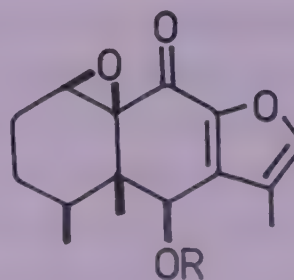


I

R = Angeloyl

II

R = Methacryloyl



III

R = Angeloyl

IV

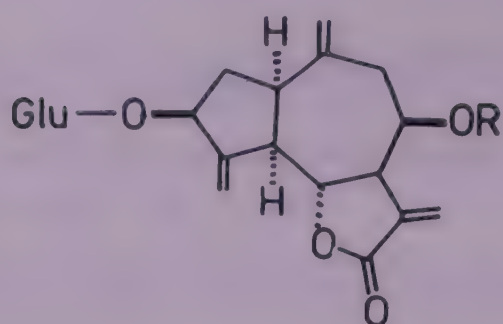
R = Methacryloyl

CREPIS (Asteraceae)

C. capillaris (L.) Wallr. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 205).

Four new sesquiterpene lactone glucosides (I, II, III and IV) isolated from roots along with two known guaianolides and their structures determined (*Phytochemistry* 1984, 23, 1955).

NEW COMPOUNDS



I

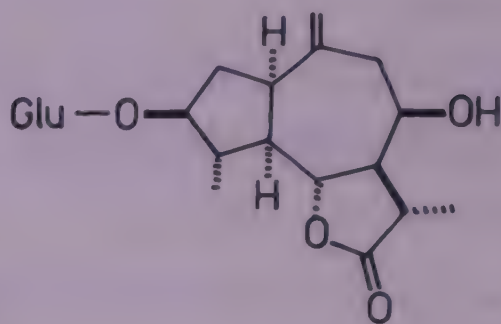
R = H

II

R = COC(Me)(OH)COMe

III

R = COC(Et)(OH)COMe



IV

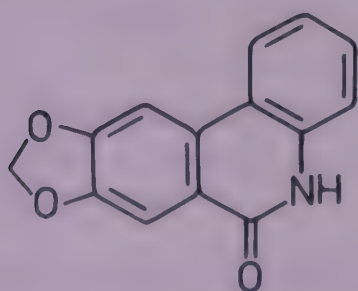
C. japonica (L.) Benth.; see *Youngia japonica* (L.) DC.

CRINUM (Amaryllidaceae)

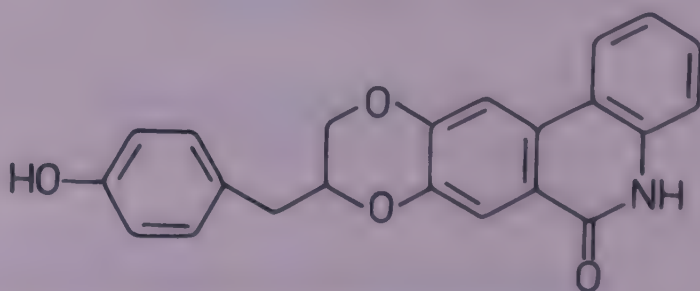
C. asiaticum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 80).

One C16-acyloxy alkaloid - palmilycorine - and an acylglucosyloxy derivative - lycoriside - isolated from fruits and characterised as 1-O-palmitoyllycorine and lycorine-1-O-(6'-O-palmitoyl- β -D-glucopyranoside) respectively (*Phytochemistry* 1985, 24, 2703); two phenanthridone alkaloids - crinasiatine and crinasiadine - isolated from flowering bulbs (*J. Chem. Res., Synop.* 1985, 100; *Chem. Abstr.* 1985, 103, 85024 d); isolation of two new alkaloids - ungeremine and criasbetaine - from fruits and their structures determination and confirmation by synthesis (*J. Chem. Res., Synop.* 1986, 112; *Chem. Abstr.* 1986, 105, 39332 w); a new schiff's base - isocraugsodine - isolated from fruits and its structure established (*Phytochemistry* 1988, 27, 1849).

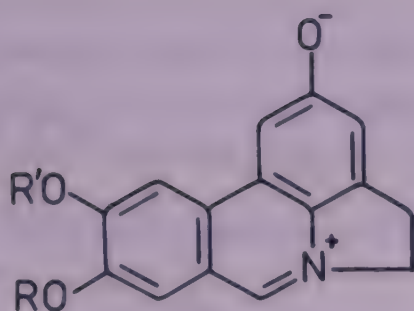
NEW COMPOUNDS



Crinasiadine



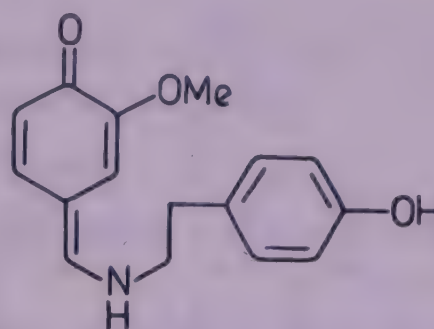
Crinasiatine



Criasbetaine

R,R' = Me

Ungeremine

RR' = -CH₂-

Isocraugsodine

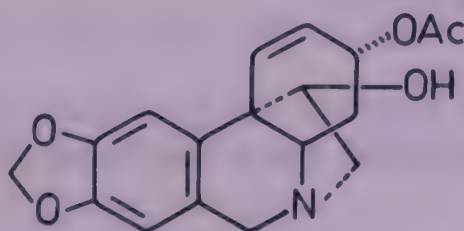
BIOLOGICAL ACTIVITY

Crinasiatine and crinasiadine exhibited bacteriostatic and tumor inhibiting activities (*J. Chem. Res., Synop.* 1985, 100; *Chem. Abstr.* 1985, 103, 85024 d).

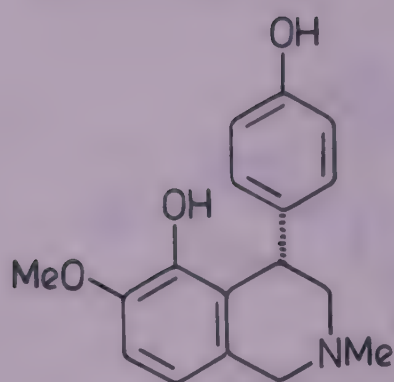
C. latifolium L. syn. *C. zeylanicum* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 205).

A new phenolic isoquinoline base - latifine - isolated from leaves and its crystal structure determined; cherylline also isolated (*Chem. Commun.* 1984, 1043); synthesis of latifine (*Chem. Lett.* 1985, 505; *Chem. Abstr.* 1985, 103, 71567 w; *J. Chem. Res., Synop.* 1986, 280; *Chem. Abstr.* 1987, 106, 18899 s; *Chem. Pharm. Bull.* 1988, 36, 3928); isolation of a new base - 3-O-acetylhamayne - along with crinamine, powelline, crinine, 1-O-acetyllycorine, hamayne, undulatine and cherylline (*Chem. Pharm. Bull.* 1984, 32, 3015); 1,2 β -epoxyambelline isolated along with ambelline and characterised (*J. Chem. Res., Synop.* 1984, 232; *Chem. Abstr.* 1985, 102, 3217 m); isolation of two new alkaloids - 11-O-acetylbambelline and 11-O-acetyl-1,2 β -epoxyambelline from bulbs - (*Pharm. Res.* 1985, 251; *Chem. Abstr.* 1985, 103, 189381 j); two water-soluble glucans A and B isolated from rhizomes (*Chem. Pharm. Bull.* 1985, 33, 16); two alkaloids - crinafoline and crinafolidine - isolated and characterised (*J. Chem. Res., Synop.* 1986, 312; *Chem. Abstr.* 1987, 106, 64286 n); rhizome contained 0.18% total alkaloids; zeylamine isolated from rhizomes and its structure determined (*Z. Chem.* 1986, 26, 438; *Chem. Abstr.* 1987, 107, 172408 h); crimidine, flexinine and 6-hydroxypowelline isolated as minor alkaloids from bulbs (*Rev. Cubana Quim.* 1988, 4, 13; *Chem. Abstr.* 1989, 111, 150588 x).

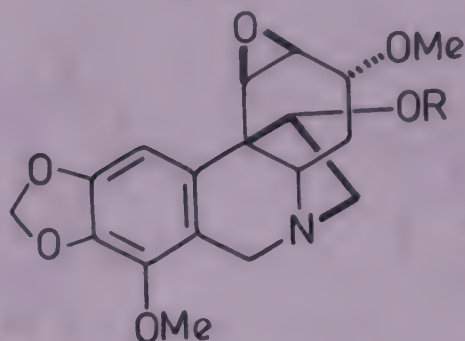
NEW COMPOUNDS



3-O-Acetylhamayne



Latifine

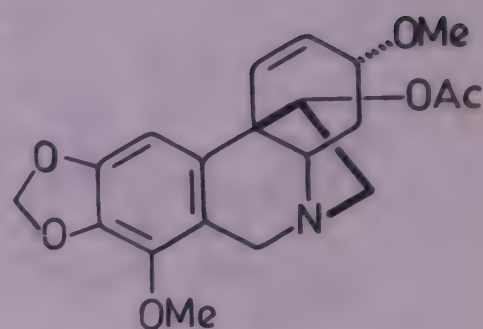


1,2β-Epoxyambelline

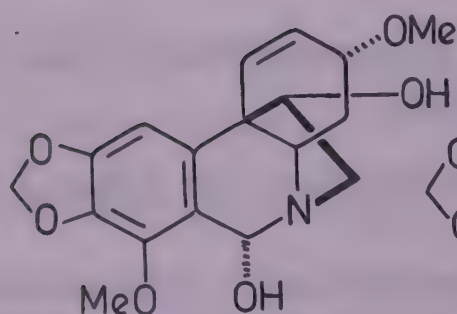
R = H

11-O-Acetyl-1,2β-epoxyambelline

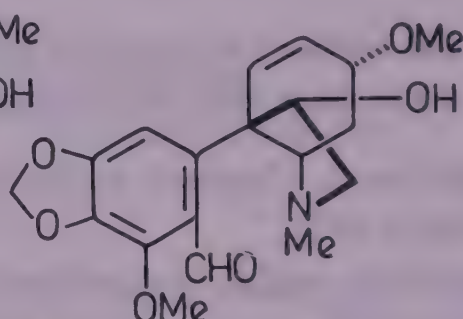
R = Ac



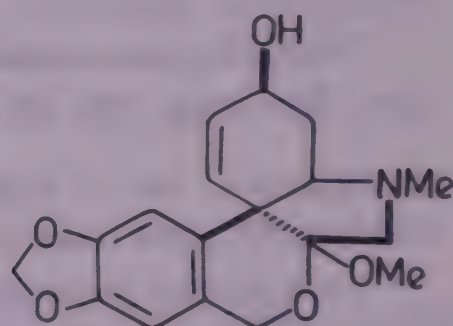
11-O-Acetylambelline



Crinafoline



Crinafolidine



Zeylamine

BIOLOGICAL ACTIVITY

1,2β-Epoxyambelline (5.0 μg/ml) produced moderate activation of mouse spleen lymphocytes while a mixture of 1,2β-epoxyambelline and ambelline (1:1) at same concentration produced pronounced activation comparable to that of concanavalin (*J. Chem. Res., Synop.* 1984, 232; *Chem. Abstr.* 1985, 102, 3217 m); 11-O-acetylambelline and 11-O-acetyl-1,2β-epoxyambelline showed immuno-regulating activity (*Pharm. Res.* 1985, 251; *Chem. Abstr.* 1985, 103, 189381 j); crinafoline and crinafolidine caused significant reduction in viability and *in vivo* growth of S-180 ascites tumor cells (*J. Chem. Res., Synop.* 1986, 312; *Chem. Abstr.* 1987, 106, 64286 n); glucan A (5.0-20.0 μg/ml) and phosphatidylglycorine (5.0-10.0 μg/ml) *in vitro* provided protection against Tween 80-induced degranulation of mast cells of rats as well as against sensitised mast cells challenged with an antigen (horse serum) (*Phytother. Res.* 1988, 2, 76; *Chem. Abstr.* 1989, 110, 88175 j).

C. zeylanicum L.; see *C. latifolium* L.

CROTALARIA (Papilionaceae)

C. anagyroides H.B. & K. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 207).

Synthesis of (+)crotanecine (*Heterocycles* 1984, 22, 2735).

C. angulata Miller syn. *C. biflora* (L.) L.

Anacrotine, apigenin-8-C-glucoside and orientin isolated from aerial parts; ¹³C-NMR spectrum of anacrotine determined (*Fitoterapia* 1988, 59, 234).

Distribution : Peninsular India, in plains.

C. assamica Benth. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 219).

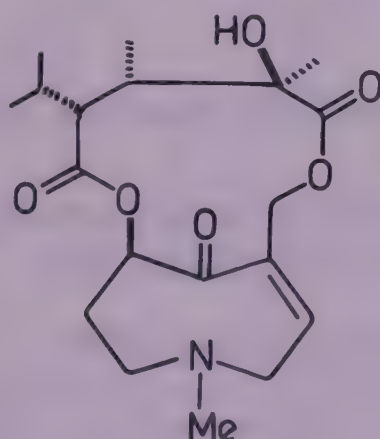
Monocrotaline (2.9%) isolated from seeds (*Sci. Pharm.* 1986, 54, 351; *Chem. Abstr.* 1987, 106, 172931 c).

C. biflora (L.) L.; see *C. angulata* Miller

C. burhia Buch.-Ham. ex Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 207).

Crosemperine isolated and its structure determined by ¹³C-NMR studies (*J. Chem. Soc. Pak.* 1986, 8, 89; *Chem. Abstr.* 1987, 106, 2864 r).

NEW COMPOUNDS



Crosemperine

C. calycina Schrank

Monocrotaline (0.9%) isolated from seeds (*Sci. Pharm.* 1986, 54, 351; *Chem. Abstr.* 1987, 106, 172931 c).

Distribution : Throughout India in plains, ascending to 1800 m in hills.

C. incana L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 208).

Synthesis of integerrimine (*J. Org. Chem.* 1986, 51, 5492).

C. juncea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 208).

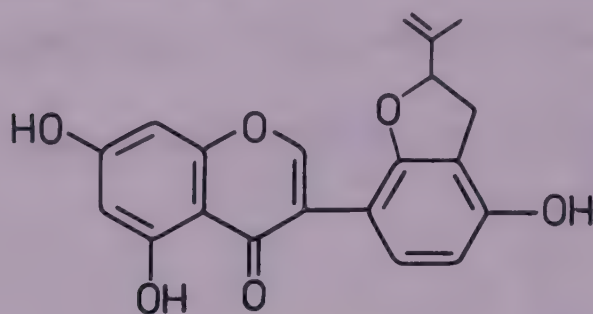
A galactomannan polysaccharide consisting of galactose and mannose in ratio of 1:3 isolated (*Proc. Natl. Acad. Sci. India* 1984, 54A, 97; *Chem. Abstr.* 1985, 102, 109824 x); riddelline, junceine and trichodesmine isolated from seeds (*Indian Drugs* 1985, 22, 495).

C. leschenaultii DC.; see *C. sericea* Retz.

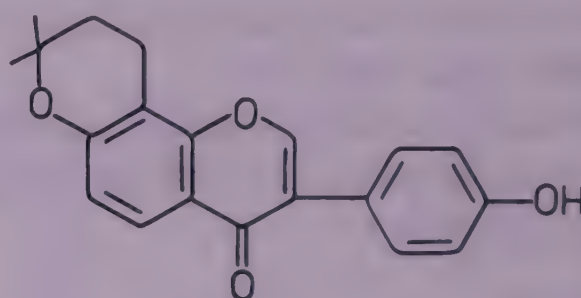
C. madurensis W. & A. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 221).

Two new isoflavones - crotarin and crotalarin - isolated from leaves and stems and their structures established (*J. Nat. Prod.* 1987, 50, 266).

NEW COMPOUNDS



Crotarin



Crotalarin

C. medicaginea Lam. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 208).

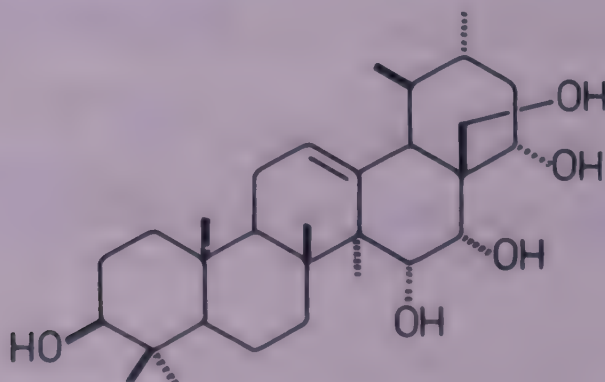
A new prenylated chalcone isolated from roots and characterised as 3',5'-di-C-prenyl-4,2',4'-trihydroxychalcone (*Phytochemistry* 1987, 26, 2866).

C. mucronata Desv.; see *C. pallida* Dryand. var. *pallida*

C. pallida Dryand. var. *pallida* syn. *C. mucronata* Desv., *C. striata* DC. (excl. var. *laburnoides* Klotzsch), *C. saltiana* Andr. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 209).

A water-soluble galactomannan containing galactose and mannose in molar ratio of 3:7 isolated from seeds (*Natl. Acad. Sci. Lett.* 1986, 9, 171); crotolarol isolated from leaves and characterised (*Bangladesh J. Sci. Ind. Res.* 1986, 21, 40; *Chem. Abstr.* 1989, 111, 4206 e).

NEW COMPOUNDS



Crotolarol

C. retusa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 209).

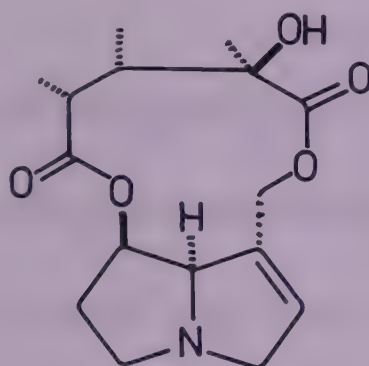
Determination of linoleic (50.2), palmitic (16.9), oleic (13.0), ricinoleic (9.8), stearic (5.3), sterculic (3.5) and malvalic (1.3%) acids in seed oil (*J. Sci. Food Agric.* 1989, 47, 253; *Chem. Abstr.* 1989, 110, 189428 z).

C. saltiana Andr.; see *C. pallida* Dryand. var. *pallida*

C. sericea Retz. syn. *C. spectabilis* Roth, *C. leschenaultii* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 210).

An improved method for isolation of monocrotaline from roots (*AICHE J.* 1988, 34, 1740; *Chem. Abstr.* 1989, 110, 28946 b); an alkaloid - crotaleschenine, previously named as crispatine - isolated and its structure revised; crystal structure of crotaleschenine determined (*Aust. J. Chem.* 1988, 41, 429).

NEW COMPOUNDS



Crotaleschenine

C. sessiliflora L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 210).

Aspartic (3.15), glutamic (2.23) acids and alanine (1.06%) identified in total amino acids (10.51%) (*Zhongyao Tongbao* 1987, 12, 425; *Chem. Abstr.* 1987, 107, 172489 k).

C. spectabilis Roth; see *C. sericea* Retz.

C. striata DC.; see *C. pallida* Dryand. var. *pallida*

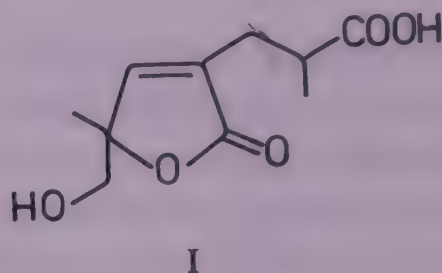
C. trifoliatrum Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 210).

Synthesis of supinidine (*Tetrahedron Lett.* 1985, 26, 3523).

C. verrucosa L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 223).

A new flavonol glycoside - kaempferol-7,4'-di-O-L-rhamnopyranoside - isolated from flowers (*Fitoterapia* 1985, 56, 175); isolation of a polysaccharide from seeds (*Carbohydr. Res.* 1988, 181, 287; *Chem. Abstr.* 1988, 109, 187382 k); a new necic acid lactone - 2-methyl-3-(2-oxo[5H]-5-hydroxymethyl-5-methyl-furan-3-yl)propanoic acid (I) - isolated from leaves and its structure elucidated (*J. Nat. Prod.* 1989, 52, 178).

NEW COMPOUNDS



CROTON (Euphorbiaceae)

C. aromaticus Hook.f.; see *C. lacciferus* L.

C. aromaticus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 82).

Isolation of (-)-hardwickiic acid (0.8%) from roots (*Planta Med.* 1987, 53, 575).

BIOLOGICAL ACTIVITY

(-)-Hardwickiic acid at 5 ppm caused 62.0% mortality among adult female aphids after 24 hr (*Planta Med.* 1987, 53, 575).

Note : According to present knowledge, the plant described in Hook.f. FBI V : 1887, p. 388 and followed in Gl. is mixture of *C. lacciferus* L. and *C. aromaticus* L. and both have same distribution.

C. caudatus Geisel. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 224).

5 α -Stigmastan-3,6-dione, taraxerone, taraxerol and sitosterol isolated from stem bark (*J. Indian Chem. Soc.* 1988, 65, 459).

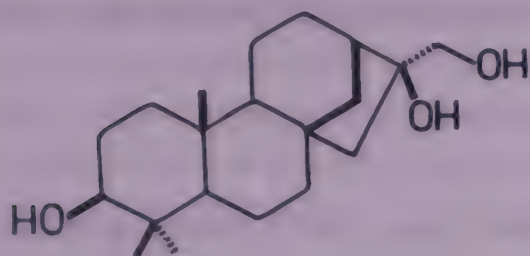
C. lacciferus L. (*lacciferum*) syn. *C. aromaticus* sensu Hook.f. p. p. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 82).

Root extract exhibited antifungal activity against *Cladosporium cladosporioides* (*Phytochemistry* 1988, 27, 225).

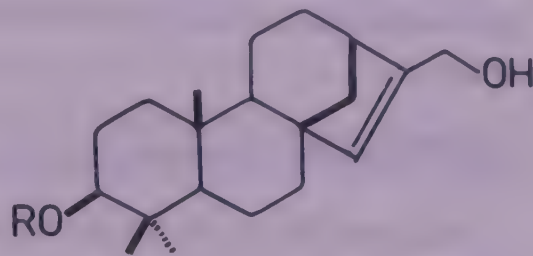
Two new compounds - ent-kauran-3 β ,16 β ,17-triol (I) and ent-kaur-15-en-17-hydroxy-3 β -yl acetate (II) - isolated from roots along with ent-kaur-15-en-17-ol, ent-kauran-16 β ,17-diol and 2,6-dimethoxybenzoquinone and structures of new compounds determined (*Phytochemistry*

1988, 27, 225); isolation and structure elucidation of 16α -H-ent-kauran-17-oic acid (III) and ent-kaur-15-en- 3β ,17-diol (IV) from roots; ent-15 β ,16-epoxykauran-17-ol, 3 β -acetoxy-D-friedo-olean-14-en-28-oic acid and oleanolic acid also isolated (*Phytochemistry* 1988, 27, 869).

NEW COMPOUNDS



I

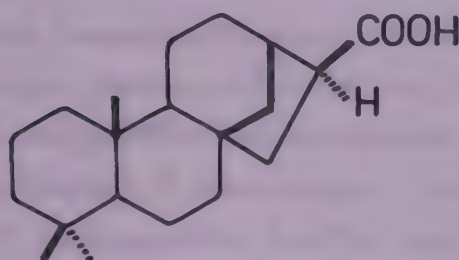


II

R = Ac

IV

R = H



III

BIOLOGICAL ACTIVITY

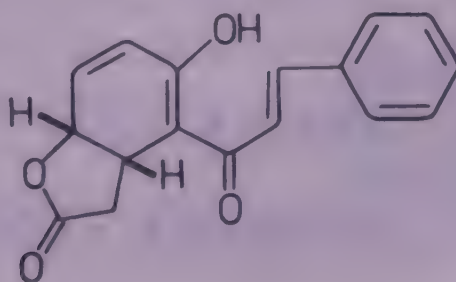
16α H-Ent-kauran-17-oic acid and ent-15 β ,16-epoxykauran-17-ol at a dose of 5 ppm caused 61.0 and 62.0% mortality respectively among adult female aphids after 24 hr (*Phytochemistry* 1988, 27, 869).

CRYPTOCARYA (Lauraceae)

C. bourdillonii Gamble (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 227).

Crystal structure of cryptocaryone determined (*Tetrahedron Lett.* 1985, 26, 5491).

NEW COMPOUNDS



Cryptocaryone

as stigmasta-7,16,25(26)-trien-3-O- β -D-glucopyranosyl(1 \rightarrow 5)-O- β -D-xylofuranoside (*Indian J. Chem.* 1987, 26B, 800).

C. melo L. var. *utilissimus* (Roxb.) Duthie & Fuller; see *C. melo* L.

C. momordica (Roxb.) Duthie & Fuller; see *C. melo* L.

C. sativus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 215).

A new 14 α -methylsterol isolated and characterised as 24(R)14 α -methyl-24-ethyl-5 α -cholest-9(11)-en-3 β -ol; 24-methylenepollinastanol also isolated (*Lipids* 1986, 21, 491); identification of codisterol, 25(27)-dehydroporiferasterol, clerosterol, avenasterol, isofucosterol, stigmasterol, campesterol, sitosterol, 25(27)-dehydrochondrillasterol, 24 β -ethyl-25(27)-dehydrolathosterol, 24 ξ -methyllathosterol, spinasterol and 22-dihydrospinasterol in seeds (*Phytochemistry* 1986, 25, 2591).

C. trigonus Roxb.; see *C. callosus* (Rottl.) Congn.

C. utilissimus Roxb.; see *C. melo* L.

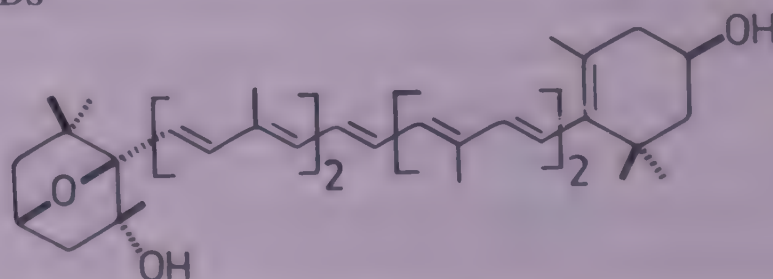
CUCURBITA (Cucurbitaceae)

C. lagenaria L.; see *Lagenaria siceraria* (Molina) Standl.

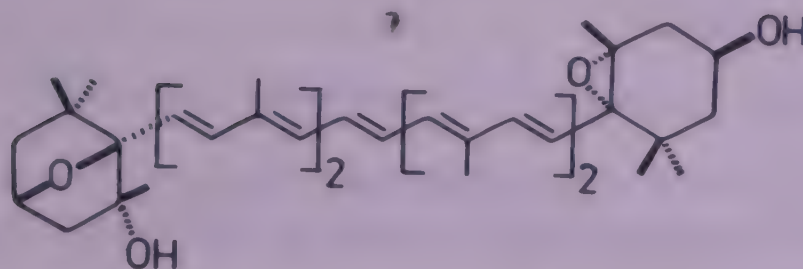
C. maxima Duch. ex Lam. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 216).

Isolation of 24 β -ethyl-5 α -cholesta-7,22,25(27)-trien-3 β -ol, 24 β -ethyl-5 α -cholesta-7,25(27)-dien-3 β -ol, avenasterol, spinasterol, 24-dihydrospinasterol, 24 ξ -methyllathosterol and 25(27)-dehydrofungisterol isolated from seeds (*Phytochemistry* 1984, 23, 2919); 25(27)-dehydroporiferasterol, clerosterol, isofucosterol, stigmasterol, sitosterol, campesterol and codisterol isolated from seeds (*Phytochemistry* 1984, 23, 2925); ¹³C-NMR of chondrillasterol studied (*Yukagaku* 1985, 34, 476; *Chem. Abstr.* 1985, 103, 51235 h); isolation of two new carotenoids - cucurbitaxanthins A and B - and their structure elucidation (*Phytochemistry* 1986, 25, 2837).

NEW COMPOUNDS



Cucurbitaxanthin A



Cucurbitaxanthin B

C. pepo L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 217).

24 β -Ethyl-5 α -cholesta-7,25(27)-dien-3-O- β -D-glucopyranoside and 24 β -ethyl-5 α -cholesta-7-trans-22,25(27)-trien-3-O- β -D-glucopyranoside isolated from seeds along with spinasteryl- β -D-glucoside (*Phytochemistry* 1985, 24, 2746); identification of codisterol, 25(27)-dehydroporiferasterol, clerosterol, isofucosterol, stigmasterol, avenasterol, campesterol, sitosterol, 25(27)-dehydrofungisterol, 25(27)-dehydrochondrillasterol, 24 β -ethyl-25(27)-dehydrolathosterol, 24 ξ -methyllathosterol, spinasterol and 22-dihydrospinasterol in seeds (*Phytochemistry* 1986, 25, 2591).

CUDRANIA (Urticaceae)

C. cochinchinensis (Lour.) Kudo & Masam. ex Sauer.; see *Maclura cochinchinensis* (Lour.) Corner

C. javanensis Hook.f.; see *Maclura cochinchinensis* (Lour.) Corner

CUMINUM (Apiaceae)

C. cyminum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 217).

Cuminaldehyde (21.95) detected in fruit essential oil (1.4%) (*Marmara Univ. Eczacilik Derg.* 1986, 2, 85; *Chem. Abstr.* 1987, 106, 38197 q).

CUNNINGHAMIA (Pinaceae)

C. lanceolata Hook.f.; see *C. sinensis* R.Br.

C. sinensis R.Br. syn. *C. lanceolata* Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 218).

Robustaflavone, sequoiaflavone, hinokiflavone, isocryptomerin, amentoflavone, di-O-methylamentoflavone, kayaflavone and apigenin isolated from leaves (*J. Indian Chem. Soc.* 1985, 62, 406); isolation of proline from pollens (*Boll. Soc. Ital. Biol. Sper.* 1985, 61, 1083; *Chem. Abstr.* 1985, 103, 211172 r).

CUPRESSUS (Cupressaceae)

C. cashmeriana Royle ex Carriere; see *C. corneyana* Hort. ex Carriere

C. corneyana Hort. ex Carriere syn. *C. funebris* auct. (non Endl.), *C. cashmeriana* Royle ex Carriere (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 231).

Quercetin-3-O-(6''-O- α -L-rhamnopyranosyl)- β -D-glucopyranoside, amentoflavone and its 7-O-methyl derivative, cupressuflavone, hinokiflavone, isocryptomerin and 7''-O-methylhinokiflavone isolated from leaves (*J. Nat. Prod.* 1987, 50, 511; *Phytochemistry* 1987, 26, 2551).

C. funebris Endl.; see *C. corneyana* Hort. ex Carriere

C. lawsoniana Murr.; see *Chamaecyparis lawsoniana* (Murr.) Parl.

C. macrocarpa Hartw.

Leaves afforded amentoflavone, sequoiaflavone and cupressuflavone (*J. Indian Chem. Soc.* 1985, 62, 170).

Distribution : Introduced into India, grown in gardens.

C. sempervirens L. syn. *C. sempervirens* L. var. *horizontalis* (Mill.) Gordon (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 218).

Synthesis of karahanaenone (*J. Org. Chem.* 1985, 50, 3160); isolation of quercetin and its 3-O- α -L-rhamnoside, hinokiflavone and isocryptomerin from leaves (*J. Nat. Prod.* 1987, 50, 511).

C. sempervirens L. var. *horizontalis* (Mill.) Gordon; see *C. sempervirens* L.

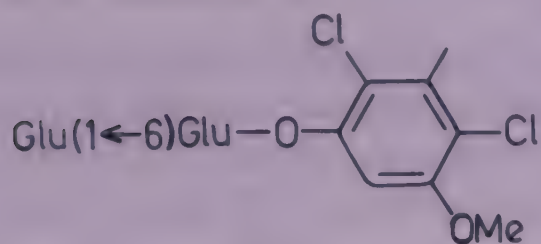
CURCULIGO (Amaryllidaceae)

C. orchoides Gaertn. syn. *Hypoxis orchoides* Kurz (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 219).

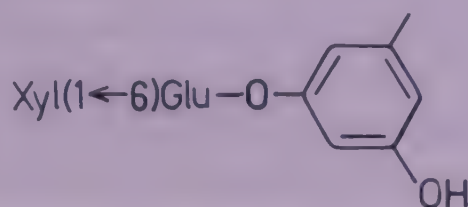
Two new aliphatic hydroxy ketones - 27-hydroxytriacontan-6-one and 23-hydroxy-triacontan-2-one - isolated from rhizomes and their structures elucidated (*Phytochemistry* 1984, 23, 1643); isolation of 21-hydroxytetracontan-20-one and 4-methylheptadecanoic acid from rhizomes (*Phytochemistry* 1984, 23, 2369); isolation and characterisation of curculigine A (*Zhongcaoyao* 1987, 18, 194; *Chem. Abstr.* 1987, 107, 194889 t); N-acetyl-N-hydroxy-2-carbamic acid methyl ester, 3-acetyl-5-carbomethoxy-2H-3,4,5,6-tetrahydro-1,2,3,5,6-oxotetrazine and N,N,N',N'-tetramethylsuccinamide isolated from rhizomes and characterised (*Indian J. Chem.* 1988, 27B, 856); isolation and structure elucidation of a new orcinol glycoside -

corchioside A - from rhizomes; hentriacontanol, sitosterol, stigmasterol, cycloartenol and sucrose also isolated (*Phytochemistry* 1989, **28**, 1771).

NEW COMPOUNDS



Curculigine A



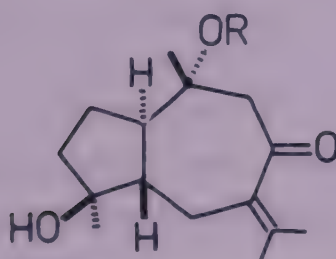
Corchioside A

CURCUMA (Zingiberaceae)

C. aromatica Salisb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 220).

Three new sesquiterpenes - isozedoarondiol, methylzedoarondiol and neocurdione - isolated along with germacrone, (4S,5S)germacrone-4,5-epoxide, curdione, dehydrocurdione, procurcumenol, zedoarondiol and curcumenone; structures of new compounds elucidated; absolute structure of zedoarondiol determined by X-ray analysis (*Chem. Pharm. Bull.* 1987, **35**, 53; *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1987, **29**, 528; *Chem. Abstr.* 1988, **109**, 190589 p); detection of germacrene D, curzerene, curzerenone, germacrone, xanthorrhizol, curcuphenol and hydroxyisogermafurenolide in essential oil by GC. (*Flavour Fragrance J.* 1989, **4**, 25; *Chem. Abstr.* 1989, **111**, 28356 e).

NEW COMPOUNDS

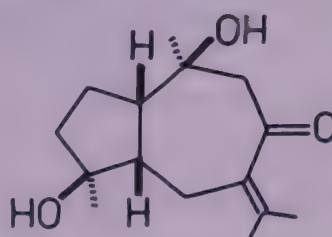


Zedoarondiol

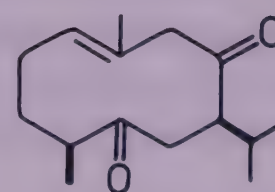
R = H

Methylzedoarondiol

R = Me



Isozedoarondiol



Neocurdione

C. caesia Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 85).

Determination of (+)linalool (20.42), (+)camphor (18.88), ocimene (15.66), 1-ar-curcumen (14.84), zingiberol (12.60), 1,8-cineole (9.06) and (+)borneol (7.0%) in rhizome essential oil (*Essenze Deriv. Agrum.* 1984, **54**, 117; *Chem. Abstr.* 1985, **103**, 128791 w).

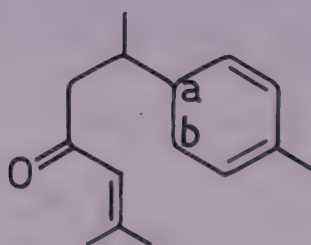
C. domestica (Medik.) Valetton; see *C. longa* L.

C. longa L. syn. *C. domestica* (Medik.) Valetton (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 220).

Rhizome essential oil showed anti-inflammatory activity in mice and rats and inhibited gastric ulcer formation in rats (*Zhongyao Tongbao* 1983, 10, 134; *Chem. Abstr.* 1985, 103, 115886 f); plant extract (0.4 mg/ml) inhibited cell growth in Chinese hamster ovary cell culture and was cytotoxic to lymphocytes and Dalton's lymphoma cells (*Cancer Lett.* (Ireland) 1985, 29, 197; *Chem. Abstr.* 1986, 104, 61654 d); plant extract caused significant reduction in ratio of total cholesterol/phospholipids in hyperlipidaemic rats and elevated HDL-cholesterol and total cholesterol ratio (*Indian J. Physiol. Pharmacol.* 1988, 32, 299).

Three antioxidant compounds - curcumin, 4-hydroxycinnamoyl(feruloyl)methane and bis-(4-hydroxycinnamoyl)methane - isolated from rhizomes (*Chem. Pharm. Bull.* 1985, 33, 1499, 1725); 2-(hydroxymethyl)anthraquinone identified in rhizomes (*Pakistan J. Sci.* 1985, 37, 15; *Chem. Abstr.* 1987, 107, 74262 m); two sesquiterpenes (I & II) along with β -turmerone isolated from rhizomes and characterised (*Tap Chi Hoa Hoc* 1987, 25, 18; *Chem. Abstr.* 1988, 108, 137682 s); curcumin (1.11), demethoxycurcumin (0.86) and bis-demethoxycurcumin (1.62%) identified in rhizomes (*Z. Lebensm.-Unters. Forsch.* 1989, 189, 116; *Chem. Abstr.* 1989, 111, 212013 s).

NEW COMPOUNDS



I

II

ab = Δ

BIOLOGICAL ACTIVITY

Curcumin, 4-hydroxycinnamoyl(feruloyl)methane and bis-(4-hydroxycinnamoyl)methane exhibited anticoagulant activity (*Chem. Pharm. Bull.* 1985, 33, 1499); curcumin showed cytotoxicity to lymphocytes and Dalton's lymphoma cells at 4.0 μ g/ml, and also reduced development of animal tumors (*Cancer Lett.* (Ireland) 1985, 29, 197; *Chem. Abstr.* 1986, 104, 61654 d); curcumin suppressed action of the tumor promoter, 12-O-tetradecanoylphorbol-13-acetate. It also showed antitumor-promoting activity in mouse skin carcinogenesis induced by 7,12-dimethylbenz(a)anthracene (*Kyoto-Furitsu Ika Daigaku Zasshi* 1987, 96, 725; *Chem. Abstr.* 1987, 107, 211555 a); curcumin (25.0-200.0 mg/kg, i.p.) protected mice against

thrombotic challenge; protection was dose related. It also inhibited mouse platelet TXB₂ *in vivo* and *in vitro* which was related to its antithrombotic activity. It inhibited cyclooxygenase activity of platelets *in vitro* as indicated by inhibition of synthesis of malonaldehyde (*Thromb. Res.* 1985, 40, 413; *Chem. Abstr.*, 1986, 104, 28637 c); curcumin, demethoxycurcumin and bis-demethoxycurcumin catalysed degradation of hyaluronic acid (HA) by influencing formation of OH radical which caused depolymerisation of HA. Effect of curcuminoids was inhibited by addition of a OH radical quencher (mannitol) (*Int. J. Pharm.* 1989, 51, 259; *Chem. Abstr.* 1989, 111, 17303 j).

C. rotunda L.; see *Boesenbergia rotunda* (L.) Mansf.

C. zedoaria (Berg.) Rosc. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 221)

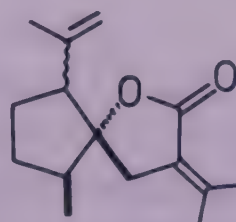
Oral and s.c. administration of plant extract significantly inhibited stress ulcer formation in restrained and water-immersed mice (*Yakugaku Zasshi* 1986, 106, 1137; *Chem. Abstr.* 1987, 106, 95935 c).

Biomimetic transformation of dehydrocurdione to curcumenol and isocurcumenol (*Tetrahedron Lett.* 1985, 26, 913); isolation of a new guaiane - zedoarondiol - from rhizomes and its characterisation (*Phytochemistry* 1985, 24, 1845); three new sesquiterpenoids - (-)curcumenone, curcumanolides A and B - isolated from rhizomes of Japanese plant; (+)germacrone-4,5-epoxide also isolated from shoots (*Phytochemistry* 1985, 24, 2629); isolation and structure elucidation of three new sesquiterpenoids - zedoarol, 13-hydroxygermacrone and curzeone - from rhizomes (*Phytochemistry* 1986, 25, 1351); furanogermenone and curcumenol identified by GLC in rhizome essential oil of plants growing in China and Taiwan (*Yakugaku Zasshi* 1986, 106, 212; *Chem. Abstr.* 1986, 105, 84919 d); total synthesis of (-)curdione (*Huaxue Xuebao* 1988, 46, 615; *Chem. Abstr.* 1989, 110, 231905 e); crystal structure of curcumol (*J. Heterocycl. Chem.* 1988, 25, 1403; *Chem. Abstr.* 1989, 111, 115613 e); ethyl p-methoxycinnamate, an antifungal constituent, isolated from rhizome essential oil (*Herba Hung.* 1989, 28, 95; *Chem. Abstr.* 1989, 111, 191496 j).

NEW COMPOUNDS



(-)Curcumenone

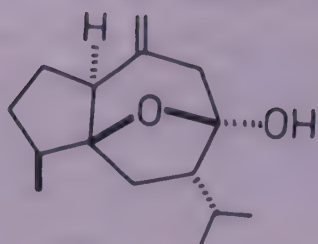


Curcumanolide A

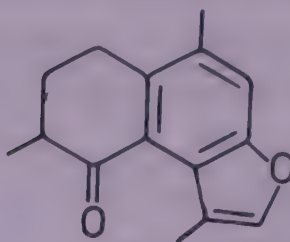
~~ = β

Curcumanolide B

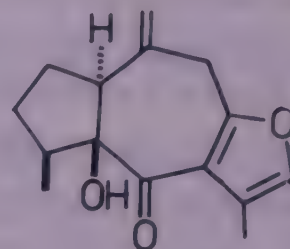
~~ = α



Curcumol



Curzeone



Zedoarol

BIOLOGICAL ACTIVITY

Furanogermenone and (4S,5S)(+)germacrone-4,5-epoxide exhibited potent preventive effect against stress ulceration (*Yakugaku Zasshi* 1986, 106, 1137; *Chem. Abstr.* 1987, 106, 95935 c).

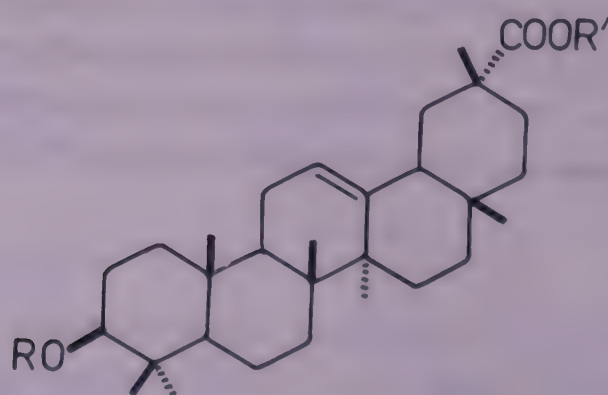
CYAMOPSIS (Papilionaceae)

C. tetragonoloba (L.) Taub. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 221).

Blood sugar and total lipids levels were significantly decreased in normal and diabetic guinea pigs which were kept on whole seed diet for four weeks. Significant fall in levels of triglycerides and phospholipids was also noticed (*Indian J. Physiol. Pharmacol.* 1987, 31, 77).

A new saponin (I) isolated from seeds and characterised as 3-O-{ α -L-rhamnopyranosyl(1 \rightarrow 4)]- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranosyl}-29-O-[α -D-glucopyranosyl(1 \rightarrow 2)-D-glucopyranosyl]-3 β -hydroxyolean-12-en-29-oate (*Phytochemistry* 1986, 25, 2675).

NEW COMPOUNDS



I

R = Gluc.acid(2 \rightarrow 1)Glu[(2 \rightarrow 1)Rha](4 \rightarrow 1)Rha, R' = Glu(2 \rightarrow 1)Glu

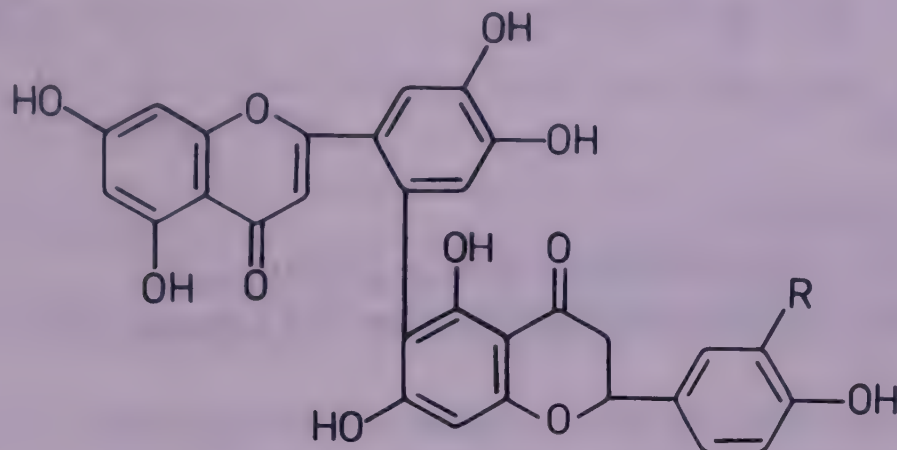
BIOLOGICAL ACTIVITY

Guar gum delayed gastric emptying rate but did not affect glucose absorption rate in glucose tolerance test in total gastrectomised rats (*Nippon Nogei Kagaku Kaishi* 1986, 60, 515; *Chem. Abstr.* 1986, 105, 147422 r).

CYATHEA (Cyatheaceae)

C. spinulosa Wall. ex Hook. syn. *Alsophila spinulosa* Tryon (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 235).

Two biflavonoids - hegoflavones A and B - isolated from fronds and their structures elucidated (*Chem. Pharm. Bull.* 1985, 33, 4182).

NEW COMPOUNDS**Hegoflavone A****R = H****Hegoflavone B****R = OH****CYCAS** (Cycadaceae)

C. revoluta Thunb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 236).

A new azoxyglycoside - neocycasin B α (isomer of neocycasin B) - isolated from seeds of Japanese plant and characterised as α -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranoside of methylazoxymethanol (*Agric. Biol. Chem.* 1985, 49, 1531).

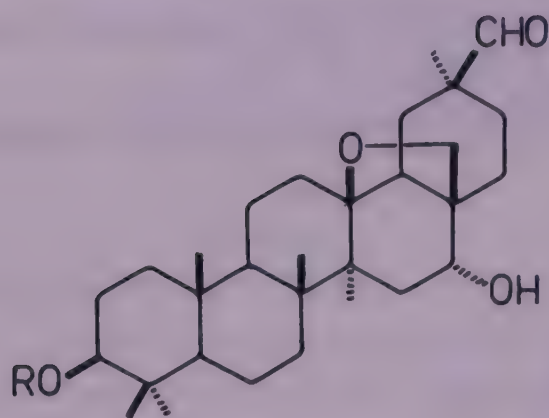
CYCLAMEN (Primulaceae)

C. africanum Boiss. & Reut.

Saponin mixture consisted mainly of desglucosylcyclamin I as major component along with cyclamin and a new saponin - isocyclamin - and small amount of desglucosylcyclamin II; acid hydrolysis of saponin complex from bulb yielded cyclamiretins A, C and D, cyclamigenin A1 and primulagenin A; cyclamiretin C shown to be identical with cyclamigenin C by NMR studies (*Phytochemistry* 1989, 28, 825).

Distribution : Introduced into Indian gardens.

NEW COMPOUNDS



Isocyclamin

$$R = \text{Ara}[(2 \rightarrow 1)\text{Glu}](4 \rightarrow 1)\text{Glu}[(2 \rightarrow 1)\text{Xyl}](6 \rightarrow 1)\text{Glu}$$

C. europaeum L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 140).

Saponin mixture consisted of cyclamin as major component along with isocyclamin and desglucosylcyclamin I (*Phytochemistry* 1989, 28, 825).

C. neapolitanum Tenore (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 224).

Saponin mixture mainly composed of cyclamin as major component along with isocyclamin and desglucosylcyclamin I (*Phytochemistry* 1989, 28, 825).

C. persicum Miller (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 140).

Saponin mixture composed mainly of desglucosylcyclamin I, cyclamin and isocyclamin in equal amounts (*Phytochemistry* 1989, 28, 825).

CYCLEA (Menispermaceae)

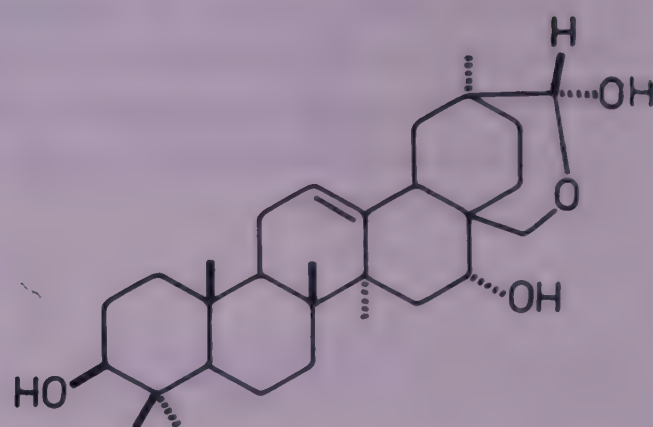
C. barbata Miers.; see *C. peltata* (Lam.) Hook.f. & Thoms.

C. peltata (Lam.) Hook.f. & Thoms. syn. *C. barbata* Miers. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 224).

Synthesis of fangchinoline (*Huaxue Xuebao* 1986, 44, 39; *Chem. Abstr.* 1986, 105, 172803 s); a water-soluble rhamnogalacturonan, composed of uronic acid, galactose and rhamnose, isolated from leaves (*Carbohydr. Polym.* 1988, 9, 49; *Chem. Abstr.* 1988, 109, 187342 x).

BIOLOGICAL ACTIVITY

Tetrandrine inhibited contraction of guinea pig tracheal and lung strips and human bronchial and lung strips induced by slow-reacting substance of anaphylaxis (SRS-A,



Cyclamiretin C

100 units/ml). At 25.0 mg/kg, i.v., given prior to SRS-A, it antagonised the augmentation of respiratory air flow by SRS-A (*Yaoxue Xuebao* 1984, 19, 616; *Chem. Abstr.* 1985, 102, 55819 d); tetrandrine antagonised noradrenaline-induced contraction of isolated rabbit vascular strips and inhibited K^+ (60.0 mM)-induced contraction of thoracic aorta strips. It also antagonised calcium-related vascular effects (*Zhongguo Yaoli Xuebao* 1984, 5, 257; *Chem. Abstr.* 1985, 102, 89840 u).

CYDONIA (Rosaceae)

C. oblonga Mill. syn. *C. vulgaris* Pers. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 225).

Three glucosides of procyanidin polymers isolated from fruits (*Phytochemistry* 1985, 24, 567); synthesis of (+) and (-) marmelo lactones A and B (*Jpn.* 6,025,987 (1985) Feb. 08; *Chem. Abstr.* 1985, 103, 104837 q); syntheses of marmelo oxide A (trans-3-methyl-5-[(E)3'-methyl-1',3'-butadien-1'-yl]tetrahydrofuran) and its cis isomer, marmelo oxide B (*J. Org. Chem.* 1989, 54, 3981).

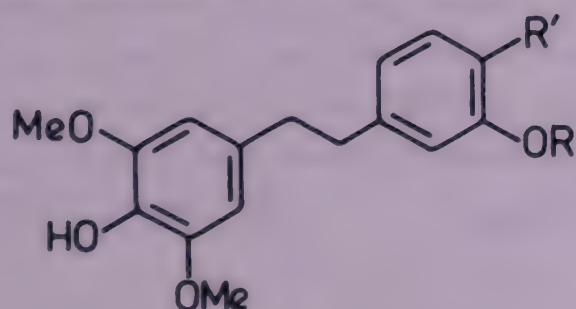
C. vulgaris Pers.; see *C. oblonga* Mill.

CYMBIDIUM (Orchidaceae)

C. aloifolium (L.) Swartz (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 87).

Two new substituted bibenzyls - aloifol I and aloifol II - and a new substituted 9,10-dihydrophenanthrene-6-O-methylcoelonin - isolated and characterised; batatasin III, coelonin and gigantol also isolated (*Phytochemistry* 1987, 26, 1123).

NEW COMPOUNDS

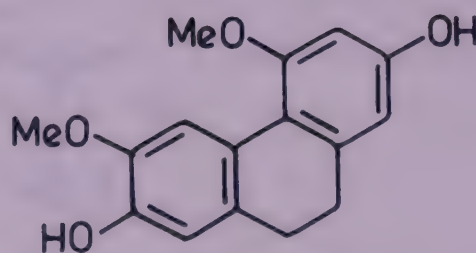


Aloifol I

R = H, R' = Me

Aloifol II

R = Me, R' = OH



6-O-Methylcoelonin

C. giganteum Wall. ex Lindl.; see *C. iridioides* D. Don

C. iridioides D.Don syn. *C. giganteum* Wall. ex Lindl. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 238).

Isolation of a 1,2-diarylethane - gigantol - and its characterisation as 1-(3'-hydroxy-5'-methoxyphenyl)-2-(4''-hydroxy-5''-methoxyphenyl)ethane; sitosterol and taraxerone also isolated (*Phytochemistry* 1985, 24, 321).

CYMBOPOGON (Poaceae)

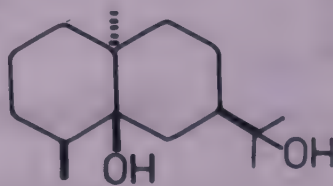
C. citratus (DC.) Stapf syn. *Andropogon citratus* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 226).

Essential oil contained citral (78.0%) (*J. Bangladesh Acad. Sci.* 1984, 8, 77; *Chem. Abstr.* 1985, 103, 19869 g; *Bangladesh J. Sci. Ind. Res.* 1986, 21, 70; *Chem. Abstr.* 1988, 109, 176059 j); determination of geraniol (37.2), geranyl acetate (9.9), neral (19.8), neryl acetate (7.5), myrcene (3.2), farnesol (2.4), limonene (2.1), 3-methyl-2-heptanone (2.0), β -pinene (1.5), α -pinene (1.3), citronellyl acetate (1.3), 6-methyl-5-hepten-2-one (1.1), linalool oxide (1.0), camphene (0.9), menthol (0.6), linalool (0.4) and citronellol (0.3%) in essential oil by GC-MS (*Fitoterapia* 1985, 56, 339); β -caryophyllene, caryophyllene oxide, citronellal, dipentene, geraniol, geranyl acetate, methyl eugenol and nerol detected in oil by GLC (*Indian J. Nat. Prod.* 1987, 3(1), 10; *Chem. Abstr.* 1988, 108, 101195 w).

C. distans (Nees ex Steud.) Wats. syn. *Andropogon distans* Nees ex Steud. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 227).

Geraniol (22.89), geranyl acetate (18.34), neral (14.74) and limonene (12.08%) estimated in essential oil by GC-MS (*Herba Hung.* 1988, 27, 117; *Chem. Abstr.* 1989, 110, 189365 b); a eudesmanediol (I) isolated from essential oil and its absolute configuration determined by X-ray analysis (*Phytochemistry* 1989, 28, 936).

NEW COMPOUNDS



I

C. flexuosus (Nees ex Steud.) Wats. syn. *Andropogon nardus* L. var. *flexuosus* (Nees ex Steud.) Hack. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 227).

Detection of α -terpinene, myrcene, ocimene, dipentene, α -pinene, p-cymene, citral and an unidentified hydroxyaldehyde in essential oil (0.9%) by GC-MS (*Bangladesh J. Sci. Ind. Res.* 1983, 18, 95; *Chem. Abstr.* 1985, 103, 120002 u); synthesis of (+) β -eudesmol (*J. Org. Chem.*

1985, 50, 1359); total synthesis of β -bisabolene (Yiyao Gongye 1985, 16, 120; Chem. Abstr. 1985, 103, 160708 k).

C. flexuosus (Nees ex Steud.) Wats. var. *sikkimensis* Bor (Compend. Indian Med. Plants, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 240).

Methyleugenol (23.0), methylisoeugenol (20.5) and limonene (16.5%) determined in essential oil by GLC (J. Bangladesh Acad. Sci. 1984, 8, 77; Chem. Abstr. 1985, 103, 19869 g; Bangladesh J. Sci. Ind. Res. 1986, 21, 70; Chem. Abstr. 1988, 109, 176059 j).

C. jwarancusa (Jones) Schult. syn. *Andropogon jwarancusa* Jones (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 228).

Essential oil of aerial parts contained piperitone (1.4%) (PAFAI J. 1985, 7, 28; Chem. Abstr. 1985, 103, 109752 t; Dev. Food. Sci. 1988, 18, 317; Chem. Abstr. 1988, 109, 226673 c).

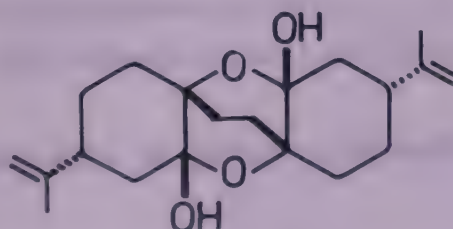
C. khasianus (Hack.) Stapf ex Bor syn. *Andropogon khasianus* Munro ex Duthie (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 228).

Determination of methyleugenol (75.0-82.0%) (Indian Perfum. 1986, 30, 339; Chem. Abstr. 1987, 106, 55600 h).

C. martinii (Roxb.) Wats. syn. *Andropogon schoenanthus* L. var. *martinii* Hook.f. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 228).

Determination of geranyl formate (5.0-15.0), eight terpene esters (0.5-1.0% each) and unidentified new compounds in essential oil samples by GLC (PAFAI J. 1985, 7, 21; Chem. Abstr. 1986, 104, 10349 a); essential oil contained limonene, α -terpinene, myrcene, β -caryophyllene, α -humulene, β - and γ -selinenes (Phytochemistry 1986, 26, 183); geraniol (76.0-83.0), geranyl butyrate, geranyl isovalerate and geranyl acetate (5.0-12.0), linalool (2.0-4.0%), methylisoeugenol, (EZ)farnesyl acetate, (ZE), (EZ) and (EE)farnesols, estragole and neryl acetate identified in essential oil from Madagascaran plants (J. Agric. Food Chem. 1987, 35, 62; Chem. Abstr. 1987, 106, 72680 b); isolation of cymbodiacetal from essential oil and its crystal structure elucidation (Phytochemistry 1987, 26, 2301).

NEW COMPOUNDS



Cymbodiacetal

C. nardus (L.) Rendle syn. *Andropogon nardus* L. (Compend. Indian Med. Plants, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 240).

Essential oil contained citronellal (32.0), citronellol (14.4) and geraniol (20.1%) (J. Bangladesh Acad. Sci. 1984, 8, 77; Chem. Abstr. 1985, 103, 19869 g).

C. nardus (L.) Rendle var. *stracheyi* Hook.f.; see *C. pospischilii* (K. Schum.) Hubbard

C. osmastonii Parker

Carveol (69.8), α -limonene (5.4) and a mixture of ketones (17.7%) found in essential oil (J. Bangladesh Acad. Sci. 1984, 8, 77; Chem. Abstr. 1985, 103, 19869 g; Bangladesh J. Sci. Ind. Res. 1986, 21, 70; Chem. Abstr. 1988, 109, 176059 j).

Distribution : Uttar Pradesh.

C. pendulus (Nees ex Steud.) Wats. syn. *Andropogon pendulus* Nees ex Steud. (Compend. Indian Med. Plants, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 241).

Citral (78.5%) isolated from oil (J. Bangladesh Acad. Sci. 1984, 8, 77; Chem. Abstr. 1985, 103, 19869 g; Bangladesh J. Sci. Ind. Res. 1986, 21, 70; Chem. Abstr. 1988, 109, 176059 j).

C. pospischilii (K.Schum.) Hubbard syn. *Andropogon nardus* L. var. *stracheyi* Hook.f., *Cymbopogon nardus* (L.) Rendle var. *stracheyi* Hook.f.; *C. stracheyi* (Hook.f.) Raiz. & Jain (Compend. Indian Med. Plants, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 241).

Piperitone (47.8) and car-2-ene (29.4%) found to be major constituents of oil from aerial parts (Indian Perfum. 1986, 30, 447; Chem. Abstr. 1987, 106, 201524 e).

C. stracheyi (Hook.f.) Raiz. & Jain; see *C. pospischilii* (K. Schum.) Hubbard

C. winterianus Jowitt (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 229).

Citronellal (32.0), citronellol (14.4) and geraniol (20.0%) determined in essential oil (Bangladesh J. Sci. Ind. Res. 1986, 21, 70; Chem. Abstr. 1988, 109, 176059 j).

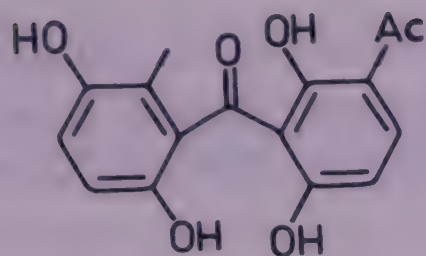
CYNANCHUM (Asclepiadaceae)

C. auriculatum Royle ex Wight

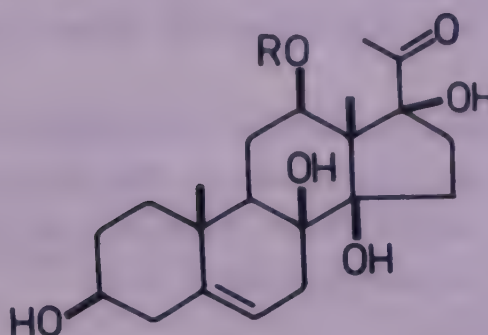
A benzophenone derivative - baishouwu benzophenone (I) - and a pregnane type aglycone - kidjolanin - along with caudatin and metaplexigenin isolated from tubers and structures of new compounds elucidated (Yaoxue Xuebao 1988, 23, 276; Chem. Asbtr. 1988, 109, 79560 h).

Distribution : Himalayas, from Kashmir to Sikkim, alt. 1800-3600 m

NEW COMPOUNDS



Baishouwu benzophenone



Kidjolanin

R = Cinnamoyl

CYNARA (Asteraceae)

C. scolymus L. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 230).

Apigenin-7-glucoside, -7-rutinoside, -7,4'-diglucoside, luteolin-7-glucoside, -3'-glucoside, -4'-glucoside, -7-rutinoside, -7,4'-diglucoside, naringenin and its 7-glucoside and 7-rhamnoside isolated from flowers (*Fitoterapia* 1987, 58, 178).

CYNOGLOSUM (Boraginaceae)

C. denticulatum A.DC. var. *zeylanica* (Lehm.) Clarke; see *C. zeylanicum* Thunb. ex Lehm.

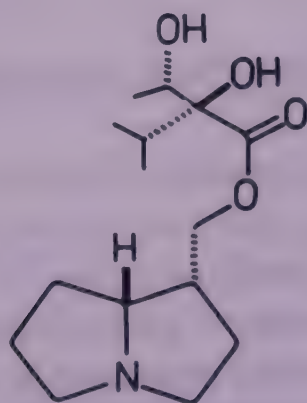
C. furcatum Wall. ex Roxb.; see *C. zeylanicum* Thunb. ex Lehm.

C. zeylanicum Thunb. ex Lehm. syn. *C. furcatum* Wall. ex Roxb., *C. denticulatum* A.DC. var. *zeylanica* (Lehm.) Clarke

Cynaustraline isolated along with β -sitosterol and lauric acid and its structure determined (*Zhongguo Yaoke Daxue Xuebao* 1987, 18, 51; *Chem. Abstr.* 1987, 107, 46142 d).

Distribution : Peninsular India.

NEW COMPOUNDS

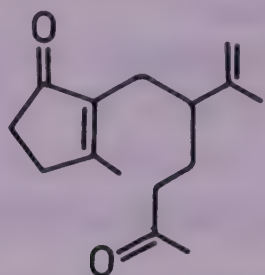


Cynaustraline

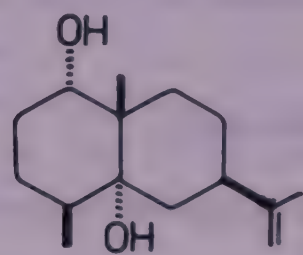
CYPERUS (Cyperaceae)

C. articulatus L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 88).

A new sesquiterpene alcohol - α -corymbolol - isolated from rhizomes and its structure determined (*Phytochemistry* 1988, 27, 179); isolation and structure elucidation of a sesquiterpenic diketone - mandassidione - from rhizomes ; mustakone and isopatchoul-4(5)-en-3-one also isolated (*Phytochemistry* 1988, 27, 3319).

NEW COMPOUNDS

Mandassidione

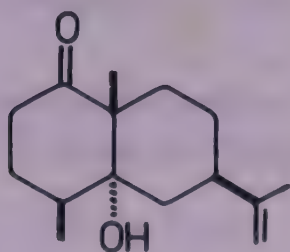
 α -Corymbolol

C. corymbosus Rottb. syn. *C. tegetiformis* Roxb.

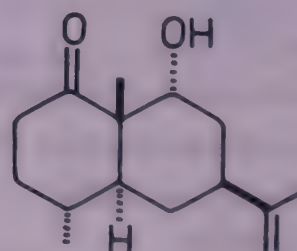
B. - Gola methi, Mudar kati, Mutha; Tel. - Godu tunga kadu; Tam. - Korai.

An eudesmane sesquiterpenoid - corymbolone - isolated and characterised (*J. Nat. Prod.* 1985, 48, 323); another new eudesmane derivative - isocorymbolone - isolated from rhizomes along with (+) α -cyperone and its structure elucidated (*Phytochemistry* 1985, 24, 2726).

Distribution : Throughout plains of India in marshy habitat.

NEW COMPOUNDS

Corymbolone



Isocorymbolone

C. rotundus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 231).

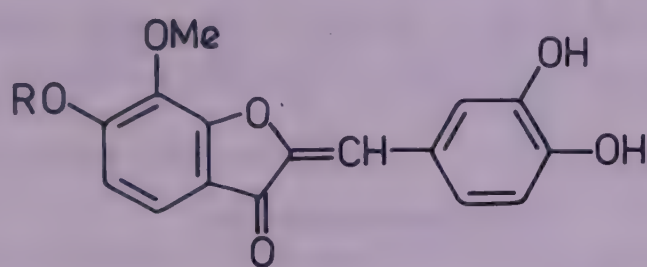
Daily instillation of root extract into eyes of 26 conjunctivitis cases decreased redness and reduced pain and ocular discharge and most patients were cured within five days (*J. Res. Ayurveda & Siddha* 1980, 1, 115); volatile oil had marked central nervous system depressant effects. It potentiated hypnotic action of pentobarbital in mice and anaesthetic action of scopolamine in rabbits. It also inhibited contraction of isolated ileum of rabbits at 20.0 nl/ml (*Zhonggyo Yaoke Daxue Xuebao* 1989, 20, 48; *Chem. Abstr.* 1989, 110, 205100 v).

Rhamnetin-3-O-rhamnosyl(1→4)rhamnopyranoside isolated from tubers (*J. Indian Chem. Soc.* 1986, 63, 450).

C. scariosus R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 232).

A tricyclic hydrocarbon - isopatchoul-3-ene - isolated from essential oil and characterised (*Phytochemistry* 1984, 23, 2367); isolation and structure determination of a new aurone - leptosidin-6-O-[β-D-xylopyranosyl(1→4)-β-D-arabinopyranoside] (I) from leaves (*Fitoterapia* 1984, 55, 370).

NEW COMPOUNDS



I

R = Ara(4→1)Xyl

C. tegetiformis Roxb.; see *C. corymbosus* Rottb.

CYPHOMANDRA (Solanaceae)

C. betacea (Cav.) Sendtn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 232).

Benzoic acid and 6-hydroxy(or 7-hydroxy)chromone isolated from fruits infected with *Colletotrichum gloeosporoides* (*Spectroscopy* 1988, 6, 151; *Chem. Abstr.* 1989, 111, 20988 s).

CYTISUS (Papilionaceae)

C. scoparius (L.) Link; see *Sarothamnus scoparius* (L.) Wimm. ex W.D.J. Koch

DAEDALACANTHUS (Acanthaceae)

D. nervosus (Vahl) T. Ander.; see *Eranthemum pulchellum* Andr.

DAEMIA (Asclepiadaceae)

D. cordata R.Br.; see *Pergularia tomentosa* L.

DALBERGIA (Papilionaceae)

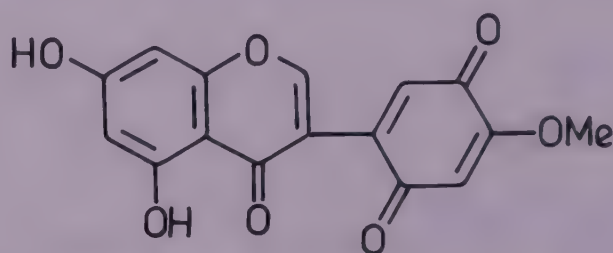
D. candenatensis (Dennst.) Prain syn. *D. monosperma* Dalz.

Trade - Kayu lakka.

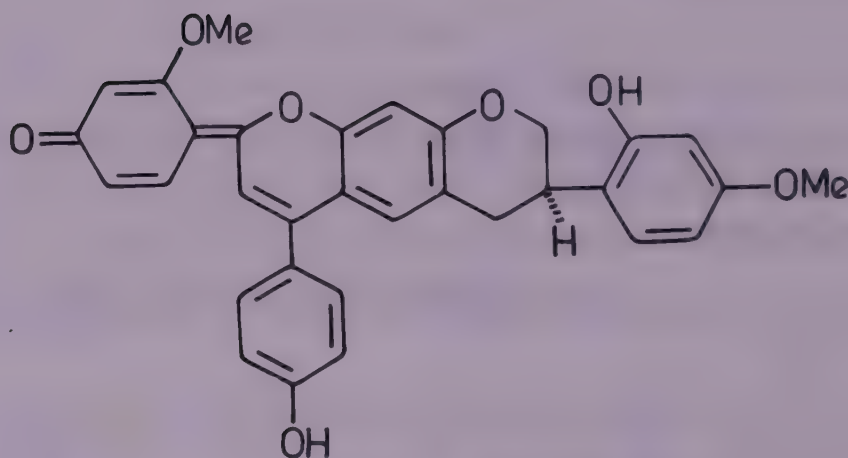
A new isoflavone quinone - 5-hydroxybowdichione - isolated from heartwood along with mucronulatol, claussequinone, formononetin and vestitol (*J. Nat. Prod.* 1987, 50, 696); a labile purple pigment - candenatone - isolated from heartwood and its structure and absolute configuration determined (*J. Org. Chem.* 1988, 53, 4161).

Distribution : Andaman Islands, Sunderbans, Mahanadi delta, southern and western India, in tidal zones.

NEW COMPOUNDS



5-Hydroxybowdichione



Candenatone

D. latifolia Roxb. var. *sissoides* (Grah. ex Wt. & Arn.) Baker; see *D. sissoides* Grah. ex Wt. & Arn.

D. monosperma Dalz.; see *D. candenatensis* (Dennst.) Prain

D. parviflora Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 234).

(+)- α -Angeloyloxylatifolone synthesised (*J. Serb. Chem. Soc.* 1985, 50, 67; *Chem. Abstr.* 1987, 106, 32659 v).

D. sissoides Grah. ex Wt. & Arn. syn. *D. latifolia* Roxb. var. *sissoides* (Grah. ex Wt. & Arn.) Baker

Eng. - Malabar blackwood; Tam. & Mal. - Vel-itti.

Biochanin A, tectorigenin and its 7-O-gentiobioside isolated from roots (*Fitoterapia* 1988, 59, 341).

Distribution : Western Ghats, from Mysore southwards.

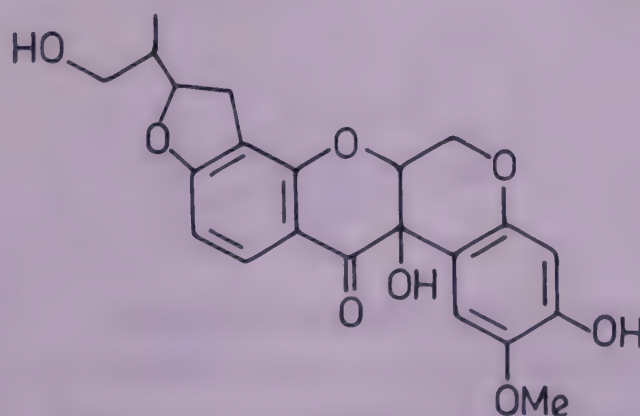
D. spinosa Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 235).

A new isoflavone glycoside - dalspinin-7-O- β -D-galactopyranoside - isolated from roots and characterised (*Indian J. Chem.* 1985, 24B, 564); isolation of dalspinosin-7-O- β -D-glucopyranoside from roots (*Indian J. Chem.* 1988, 27B, 693); two new isoflavone glycosides - prunetin-4'-O- β -D-galactoside and 7-methyltectorigenin-4'-O- β -D-galactoside - isolated from leaves along with prunetin and 7-methyltectorigenin and their structures determined; caviunin, dalspinin and dalbergin isolated from stem bark (*Phytochemistry* 1988, 27, 2364).

D. volubilis Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 235).

A new rotenolone (I) isolated from twigs and characterised (*J. Chem. Res., Synop.* 1987, 168; *Chem. Abstr.* 1987, 107, 74265 q); isolation of sitosterol, 7-hydroxy-4-methylcoumarin, dalbergin, p-hydroxycinnamic acid, biochanin A and volubolin from twigs (*J. Chem. Res., Synop.* 1987, 168; *Chem. Abstr.* 1987, 107, 74265 q; *Bull. Soc. Chim. Fr.* 1989, 82); isolation and characterisation of 7,4'-dihydroxy-3'-methoxy-4-phenyl-2H-1-benzopyran-2-one, 7,3'-dihydroxy-5,4'-dimethoxy-2H-1-benzopyran-2-one, 7,3'-dihydroxy-5,4'-dimethoxy-6-formyl-2H-1-benzopyran-2-one and a complex hydroxyrotenoid along with kaempferol and umbelliferone (*Bull. Soc. Chim. Fr.* 1989, 82).

NEW COMPOUNDS



I

DAPHNE (Thymelaeaceae)

D. acuminata Stocks; see *D. mucronata* Royle

D. mucronata Royle syn. *D. acuminata* Stocks (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 236).

Esculetin synthesised (*Arch. Pharmacol. Res.* 1986, 9, 115; *Chem. Abstr.* 1987, 106, 113124 u).

BIOLOGICAL ACTIVITY

Esculetin (ED₅₀ 4.3 µg/ml) exhibited cytotoxic activity against L1210 cells (*Arch. Pharmacol. Res.* 1986, 9, 115; *Chem. Abstr.* 1987, 106, 113124 u); intravenous administration of daphnetin reduced formation of thrombus in rats induced by placing a silk thread in carotid-jugular extracorporeal shunt. It also inhibited platelet aggregation *in vivo* in rabbits and ADP-induced platelet aggregation *in vitro*. It prolonged blood clotting time in mice on i.p. administration (*Yaoxue Xuebao* 1986, 21, 498; *Chem. Abstr.* 1986, 105, 164710 u).

DATURA (Solanaceae)

D. alba Nees; see *D. metel* L.

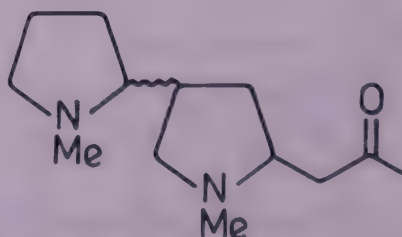
D. fastuosa L.; see *D. metel* L.

D. fastuosa L. var. *alba* (Nees) Clarke; see *D. metel* L.

D. innoxia Mill. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 236).

Two lectins - lectin 11 and lectin 12 - composed of arabinose, fucose, xylose, mannose, galactose and glucose in molar ratio of 6:1:2:1:2:2 and 1:2:1:1:3 respectively, isolated from seeds (*Khim. Prir. Soedin.* 1985, 846; *Chem. Abstr.* 1986, 104, 145565 p); two isomeric (R and S)N-methylpyrrolidinylhygrines identified in aerial parts by GLC and GLC-MS along with hygrine and tyramine (*Planta Med.* 1987, 53, 192).

NEW COMPOUNDS



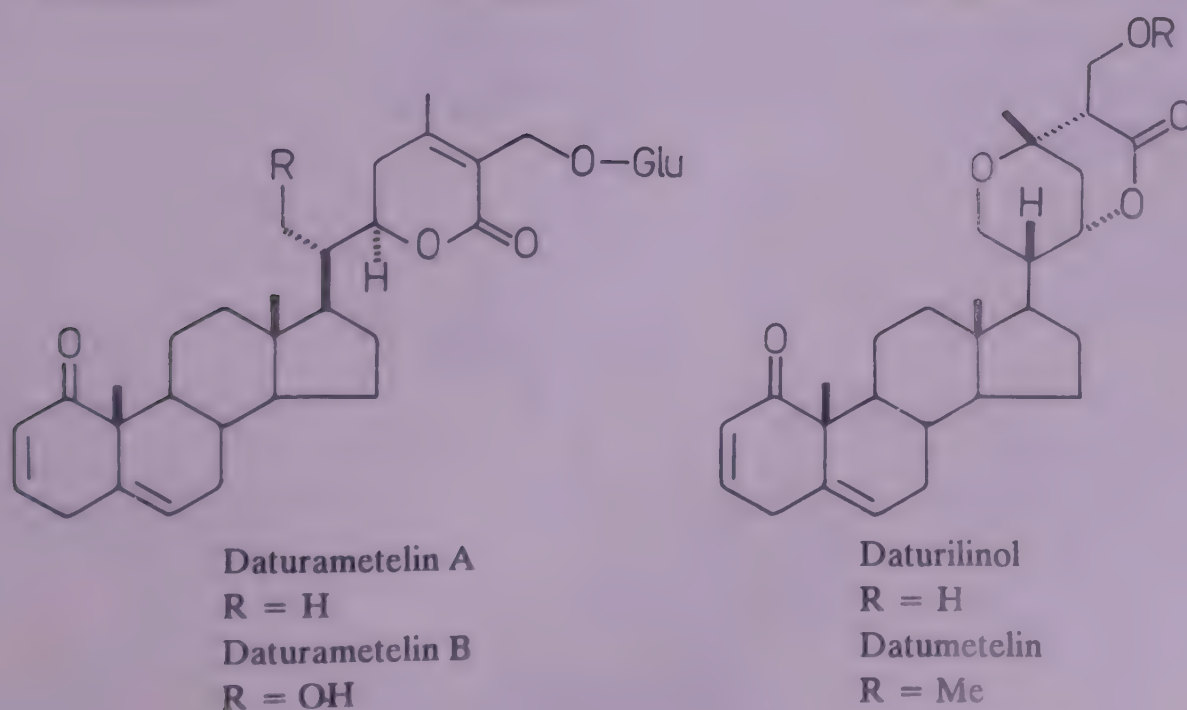
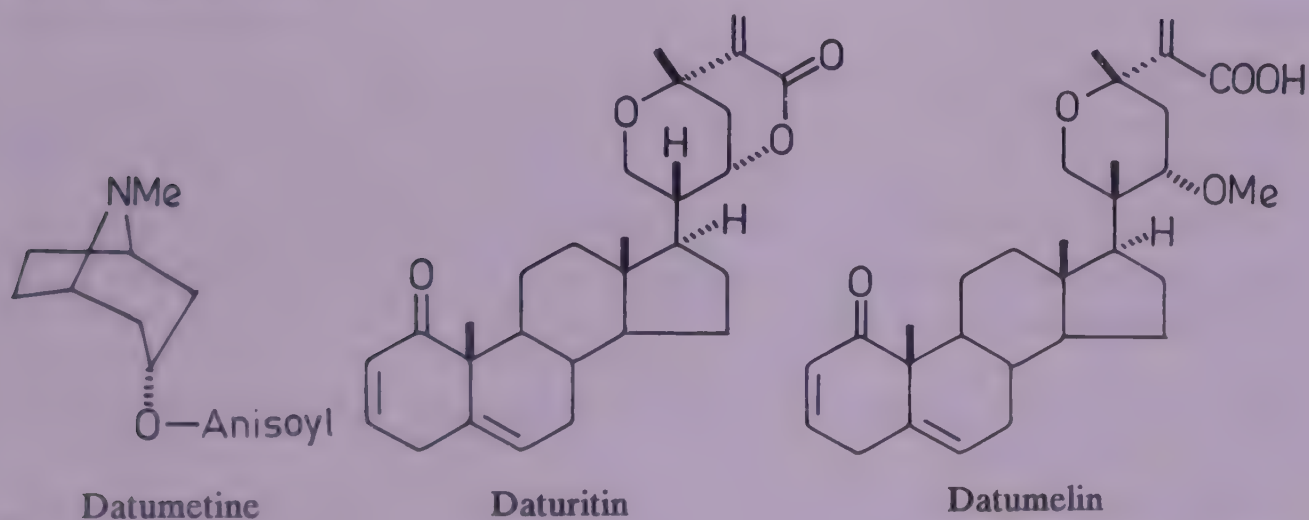
N-Methylpyrrolidinylhygrine

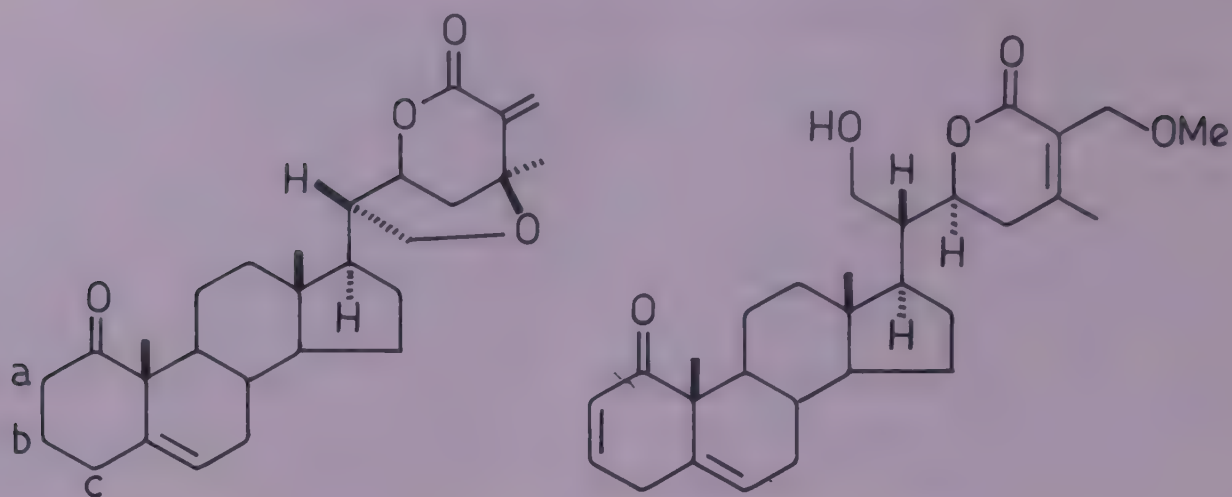
D. metel L. syn. *D. fastuosa* L., *D. fastuosa* L. var. *alba* (Nees) Clarke, *D. alba* Nees (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 237).

Chronic administration of seed extract to rat increased brain lipid peroxidase and catalase activities and decreased fructose diphosphate aldolase and glucose-6-phosphate dehydrogenase activities. A significant decrease in DNA, RNA and protein contents was also observed (*Jap. J. Pharmacol.* 1987, 44, 1).

Seed oil contained oleic (64.51), linoleic (18.87) and saturated (16.60%) acids (*Bangladesh J. Sci. Ind. Res.* 1983, 18, 55; *Chem. Abstr.* 1985, 103, 120001 t); a new tropane alkaloid - datumetine - isolated from leaves and characterised; atropine and scopolamine also isolated (*J. Nat. Prod.* 1986, 49, 511); isolation of a new withanolide - daturilin - from fresh leaves and its structure elucidation (*Phytochemistry* 1987, 26, 2641; *Planta Med.* 1988, 54, 468); datumelin isolated from fresh leaves and characterised (*Pakistan J. Sci. Ind. Res.* 1987, 30, 567; *Chem. Abstr.* 1988, 108, 52824 q); two new withanolide glucosides - daturametelins A and B - isolated from whole plant and their structures determined (*Chem. Pharm. Bull.* 1987, 35, 4359); isolation and structure elucidation of daturilinol from leaves (*Heterocycles* 1988, 27, 101); datumetelin isolated from leaves and characterised (*Planta Med.* 1988, 54, 468; *J. Indian Chem. Soc.* 1988, 65, 526); isolation of withametelin and isowithametelin from leaves and their structure determination (*Tetrahedron* 1989, 45, 2165); a new withanolide - seco-withametelin - isolated from leaves and its structure established (*Phytochemistry* 1989, 28, 1769).

NEW OMPOUNDS





Withametelin

ab = Δ

Isowithametelin

bc = Δ

Seco-withametelin

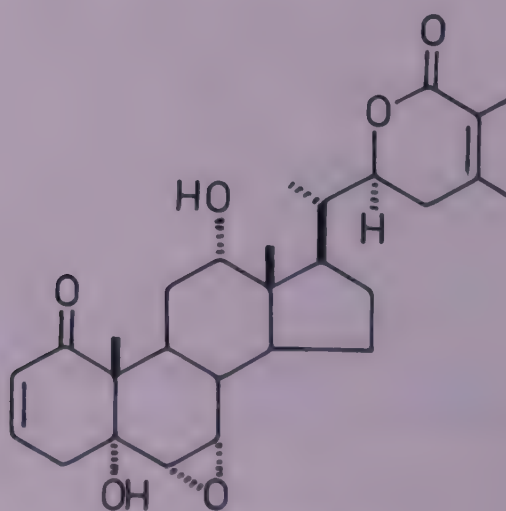
BIOLOGICAL ACTIVITY

Scopolamine showed no effect on nonopioid stress analgesia but attenuated opioid analgesia (*Brain Res.* 1985, 361, 405; *Chem. Abstr.* 1986, 104, 61981 h); increased ambulatory activity by administration of scopolamine to seven strains of mice, studied (*Jap. J. Pharmacol.* 1987, 45, 551); scopolamine (i.p. or i.v.) was effective against experimental cardiac arrhythmias induced in mice, rats, rabbits and guinea pigs (*Zhongguo Yaolixue Yu Dulixue Zazhi* 1988, 2, 311; *Chem. Abstr.* 1989, 110, 33561 b).

D. quercifolia H.B. & K. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 238).

Withaferoxolide isolated from aerial parts and its structure determined; lycium substance B and withanicandrin also isolated (*Phytochemistry* 1984, 23, 1717); identification of β -sitosterol and daturaolone in seed oil (*Fitoterapia* 1986, 57, 378).

NEW COMPOUNDS

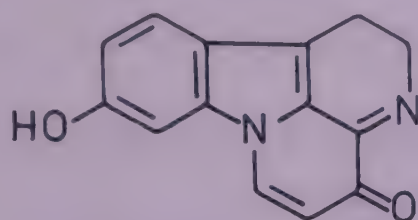


Withaferoxolide

D. stramonium L. var. *stramonium* (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 238).

1,2-Dehydrofluorodaturine isolated from seeds and characterised (*Sci. Pharm.* 1984, 52, 301; *Chem. Abstr.* 1985, 102, 163687 t); hyoscine, 3 α ,6 β -ditigloyloxytropane, 3 α ,6 β -ditigloyloxytropane-7 β -ol, apoatropine, tigloidine, tropine and meteloidine isolated from Nigerian plant (*Nigerian J. Pharm. Sci.* 1986, 2, 46; *Chem. Abstr.* 1986, 105, 178284 v).

NEW COMPOUNDS



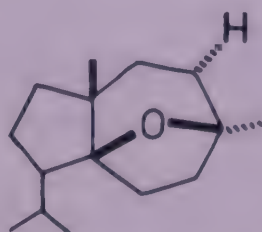
1,2-Dehydrofluorodaturine

DAUCUS (Apiaceae)

D. carota L. syn. *D. carota* L. ssp. *carota* (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 238).

n-Alkanes (C13-58) with n-nonacosane, n-heptacosane and n-hentriacontane predominating isolated from roots along with β -sitosterol, leucine, valine, tryptophan, proline, alanine, glycine, glucose and fructose (*Indian Drugs* 1985, 22, 334); synthesis of daucene (*Synth. Commun.* 1985, 15, 1217; *Chem. Abstr.* 1987, 106, 33337 a); fatty acids in wild carrot fruit fatty oil (9.12%) determined by GLC as petroselinic (76.25), linoleic (14.3), palmitic (3.75), capric (2.08), lauric (1.54), γ -linolenic (0.62), stearic (0.41), palmitoleic (0.31) and α -linolenic (0.31%) acids; sterol fraction consisted of β -sitosterol (35.4), avenasterol-7-ene (32.2) and stigmasterol (12.6%) (*Pharmazie* 1986, 44, 166; *Chem. Abstr.* 1989, 111, 54175 q); asymmetric synthesis of bisabolene (*Tetrahedron* 1986, 42, 2193); trans-asarone (40.32), β -bisabolene (20.13), asarone aldehyde (6.08), cis-asarone (4.10), eugenol (1.72), methyl eugenol (1.23), 2-hydroxy-4-methoxyacetophenone (1.33) and car-3-ene (1.27%) determined in fruit essential oil (*Nippon Nogeikagaku Kaishi* 1989, 63, 185; *Chem. Abstr.* 1989, 110, 179345 f); a new sesquiterpene ether - carota-1,4 β -oxide - isolated from seed essential oil and its structure elucidated (*Phytochemistry* 1989, 28, 639).

NEW COMPOUNDS



Carota-1,4 β -oxide

D. carota L. ssp. *carota*; see *D. carota* L.

D. carota L. ssp. *sativus* (Hoffm.) Arcang. (*sativa*) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 91).

Fatty oil (9.87%) from cultivated carrot contained petroselinic (64.08), myristic (12.02), linoleic (10.75), capric (6.08), palmitic (3.81), lauric (2.34), palmitoleic (0.57) and stearic (0.33%) acids; β -sitosterol (67.0) and stigmasterol (23.1%) present in sterol fraction (*Pharmazie* 1986, 44, 166; *Chem. Abstr.* 1989, 111, 54175 q).

DAVALLIA (Davalliaceae)

D. divaricata Blume (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 254).

Four flavanol glycosides - 3-O- β -D-allopyranosides of (-)epicatechin and (+)catechin, (-)epicatechin-3-O- β -D-(2''-O-vanillyl)allopyranoside and (-)epicatechin-3-O- β -D-(3''-O-vanillyl)allopyranoside - and three proanthocyanidin glycosides - procyanidin B2-3''-O- β -D-allopyranoside, epiafzelechin(4 β →8)-epicatechin-3-O- β -D-allopyranoside and epicatechin(4 β →8)-epicatechin(4 β →8)-catechin-3-O- β -D-allopyranoside - isolated along with procyanidins B1, B2 and a trimeric procyanidin; new compounds characterised (*Phytochemistry* 1989, 28, 891).

D. trichomanoides Blume

(R)Vicianin identified in fronds and fiddleheads (*Z. Naturforsch.* 1986, 41C, 5; *Chem. Abstr.* 1986, 104, 145550 e).

Distribution : Eastern Himalayas.

DEHAASIA (Lauraceae)

D. kurzii King

Boldine isolated from stem bark (*Fitoterapia* 1987, 58, 430); n-nonacosane isolated from stems (*Chittagong Univ. Stud.*, Part 2 1987, 11, 131; *Chem. Abstr.* 1989, 111, 20858 z).

Distribution : Andaman Islands.

DELONIX (Caesalpiniaceae)

D. elata (L.) Gamble syn. *Poinciana elata* L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 255).

Plant extract produced dose-dependent inhibition of rat paw oedema.

Quercetin-3-O-rhamnoglucoside and -3-O-galactoside isolated from fresh flowers (*Indian Drugs* 1984, 22, 92).

D. regia (Boj. ex Hook.) Rafin. syn. *Poinciana regia* Boj. ex Hook. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 255).

β -Sitosterol, lupeol, quercetin, proline, lysine, alanine, valine, tyrosine, glucose, galactose and rhamnose isolated from wood (*Natl. Acad. Sci. Lett.* 1987, 10, 197).

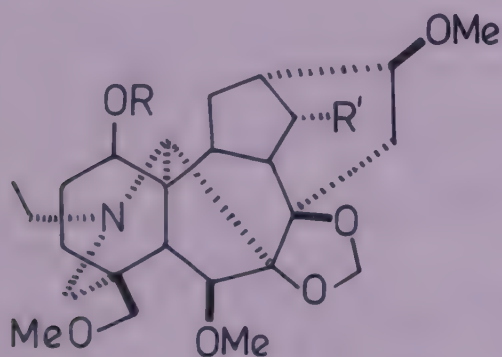
DELPHINIUM (Ranunculaceae)

D. ajacis L.; see *Consolida ambigua* (L.) Ball. & Heywood

D. brunonianum Royle (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 92).

A new diterpenoid alkaloid - brunonine - isolated and its structure established by X-ray crystallography (*Heterocycles* 1986, 24, 869); isolation of three new alkaloids - delbrunine, delbruline and delbrusine - and their structures elucidation (*Heterocycles* 1986, 24, 873).

NEW COMPOUNDS



Delbrunine

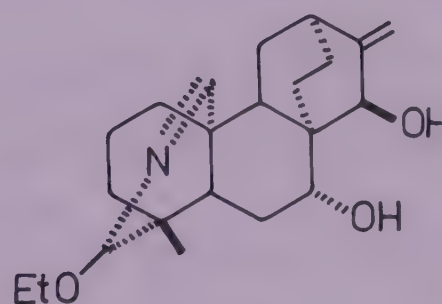
R = H, R' = OH

Delbruline

R = Me, R' = OH

Delbrusine

R = Me, R' = OMe



Brunonine

D. cashmerianum Royle (*cashmirianum*) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 239).

BIOLOGICAL ACTIVITY

N-Deacetylappaconitine and lappaconitine exhibited analgesic, anti-inflammatory and antipyretic activities in various animals; i.p. LD50 of former in mice was 23.5 mg/kg and in rats 29.9 mg/kg whereas that of latter was 10.5 mg/kg in mice and 9.9 mg/kg in rats (*Zhongguo Yaoli Xuebao* 1987, 8, 301; *Chem. Abstr.* 1987, 107, 168413 p).

D. denudatum Wall. ex Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 255).

Aqueous extract showed anticonvulsant activity in rats (*J. Res. Ayurveda & Siddha* 1982, 3, 176).

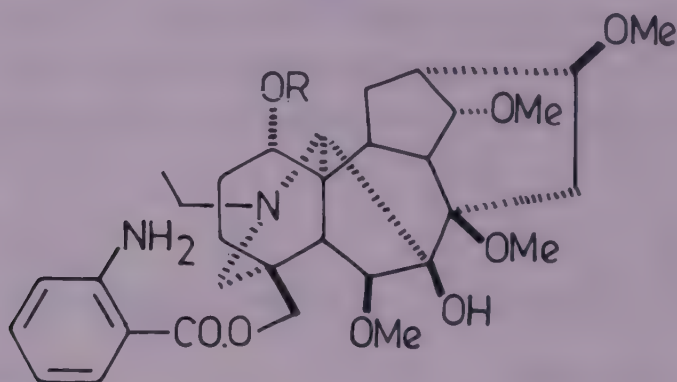
D. elatum L.; see *D. vestitum* Wall. ex Royle

D. speciosum Janka ex Nym.; see *D. vestitum* Wall. ex Royle

D. vestitum Wall. ex Royle syn. *D. elatum* auct. (non L.), *D. speciosum* Janka ex Nym. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 255).

Aerial parts afforded lycaconitine, methyllycaconitine, anthranoyllycoctonine, gigactonine and an unidentified alkaloid (*Khim. Prir. Soedin.* 1984, 671; *Chem. Abstr.* 1985, 102, 42894 z); two new diterpenoid alkaloids - delvestine and delvestidine - isolated and characterised (*Heterocycles* 1985, 23, 2483).

NEW COMPOUNDS



Delvestine

R = H

Delvestidine

R = Me

DENDRANTHEMA (Asteraceae)

D. mutellina (Hand.-Mazz.) Kitamura syn. *Tanacetum nubigenum* sensu Hook.f. (non Wall. ex DC.) p.p.

H. - Dhoop gogul.

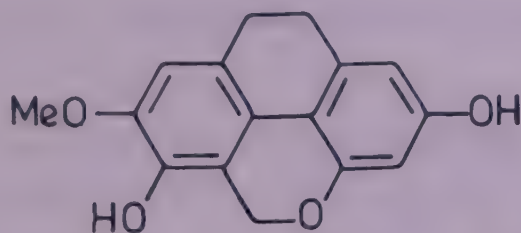
Two new alkane hydroxyketones - 22-hydroxyoctacosan-25-one and 24-hydroxy-triacontan-27-one - isolated and characterised; tetra- and hexacosanoic acids, β -sitosterol and its glucoside also isolated (*J. Nat. Prod.* 1989, 52, 837).

Distribution : Himalayas, from Ladakh to Arunachal Pradesh, alt. 2700-3600 m.

DENDROBIUM (Orchidaceae)

D. amoenum Wall. ex Lindl. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 256).

Amoenumin isolated and its structure established (*Phytochemistry* 1989, 28, 950).

NEW COMPOUNDS

Amoenumin

D. calceolaria Carey ex Hook.; see *D. moschatum* (Buch.-Ham.) Swartz

D. candidum Wall. ex Lindl.

Three O-acetylglucomannans - candidumans I, II and III - isolated (*Yunnan Zhiwu Yanjiu* 1988, 10, 389; *Chem. Abstr.* 1989, 111, 36619 h).

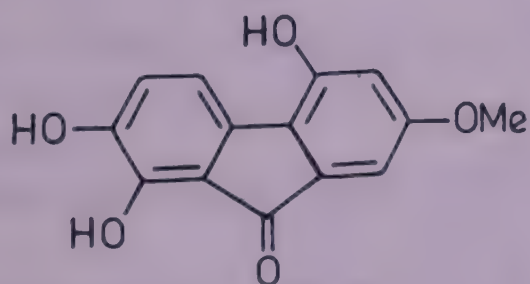
Distribution : Himalayas, from Kumaon to Bhutan and Meghalaya, alt. 900-2500 m.

D. chrysanthum Wall. ex Lindl. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 256).

A new dihydrostilbene isolated and characterised as 4,4'-dihydroxy-3,3',5'-trimethoxy-bibenzyl (*J. Nat. Prod.* 1987, 50, 1189).

D. densiflorum Lindl. syn. *D. thrysiflorum* Reichb.f. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 257).

Isolation and characterisation of dendroflorin and dengibsin; scopoletin methyl ether, psoralen, oleanolic acid and β -sitosterol also isolated (*J. Indian Chem. Soc.* 1984, 61, 1010).

NEW COMPOUNDS

Dendroflorin

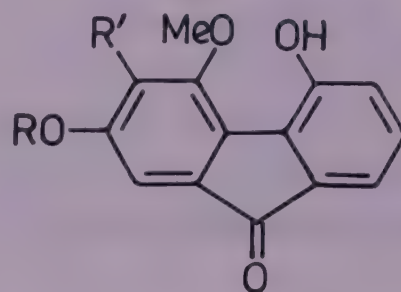
D. fuscescens Griff.; see *Epigeneium fuscescens* (Griff.) Summ.

D. gibsonii Lindl.

Dengibsin and dengibsinin isolated together with aurantiamide acetate, dimethyl terephthalate and β -sitosterol; structures of dengibsin and dengibsinin proposed (*Tetrahedron* 1985, 41, 2765); structures of dengibsin and dengibsinin revised as 2,5-dihydroxy-4-methoxy-9-fluorenone and 3,5-dihydroxy-2,4-dimethoxy-9-fluorenone respectively (*Indian J. Chem.* 1988, 27B, 250).

Distribution : Himalayas, Nepal eastward, alt. 900-2000 m.

NEW COMPOUNDS



Dengibsin

R, R' = H

Dengibsinin

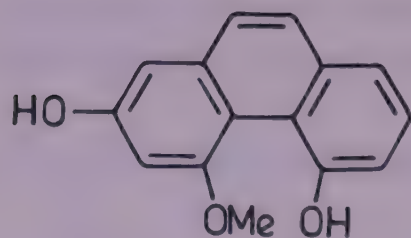
R = Me, R' = OH

D. moschatum (Buch.-Ham.) Swartz syn. *D. calceolaria* Carey ex Hook.

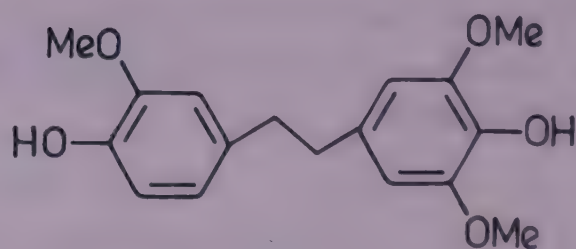
A new phenanthrene derivative - moscatin - isolated and its structure elucidated (*Indian J. Chem.* 1987, 26B, 18); isolation of a new dibenzyl compound - moscatilin - and its characterisation (*Phytochemistry* 1987, 26, 2121).

Distribution : Himalayas, from Kumaon to Bhutan and Meghalaya, alt. 600-1000 m.

NEW COMPOUNDS



Moscatin

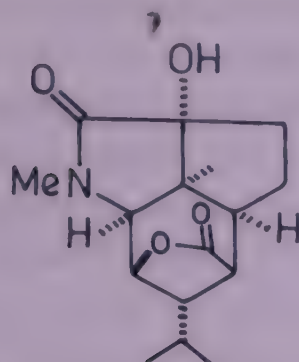


Moscatilin

D. nobile Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 240).

A new alkaloid - 3-hydroxy-2-oxodendrobine - isolated from stem along with dendrobine and its structure determined (*J. Nat. Prod.* 1985, 48, 796).

NEW COMPOUNDS



3-Hydroxy-2-oxodendrobine

D. thrysiflorum Reichb.f.; see *D. densiflorum* Lindl.

DENDROPANAX (Araliaceae)

D. chevalieri (Vigwior) Merr. syn. *D. japonicus* sensu Hook.f. (non Seem.)

Isolation of liriodendrin, syringin, sucrose, β -sitosterol and stearic acid from roots and stems (Zhongcaoyao 1989, 20, 9; Chem. Abstr. 1989, 111, 63805 x).

Distribution : Khasi Hills in Meghalaya, alt. 1200-1500 m.

D. japonicus Seem.; see *D. chevalieri* (Vigwior) Merr.

DENDROPTHOE (Loranthaceae)

D. falcata (L.f.) Etting. syn. *Loranthus longiflorus* Desr. (Compend. Indian Med. Plants, Vol 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 240).

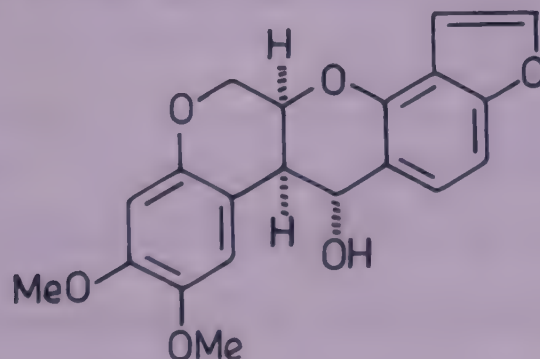
Quercetin and gallic, ellagic and chebulinic acids isolated from plant growing on *Terminalia tomentosa* (Leather Sci. 1985, 32, 206; Chem. Abstr. 1986, 104, 165366 c).

DERRIS (Papilionaceae)

D. elliptica (Wall.) Benth. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PII New Delhi, 1993, p. 240).

A new rotenoid - elliptinol - isolated from roots together with deguelin and tephrosin and its structure determined (Planta Med. 1989, 55, 207).

NEW COMPOUNDS

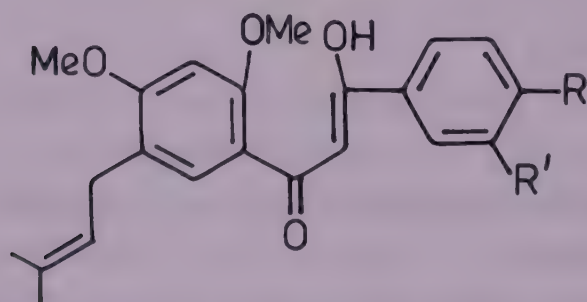


Elliptinol

D. indica (Lamk.) Bennet syn. *Pongamia glabra* Vent., *P. pinnata* (L.) Pierre (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 241).

A water-soluble polysaccharide composed of arabinose, galactose and glucuronic acid in molar ratio of 1.9:1.0:1.0 isolated from gum (*Indian J. Chem.* 1985, 24B, 171); isolation of cycloart-23-en-3 β ,25-diol, friedelin, lupeol, lupenone, karanjin, 5-methoxyfurano(4'',5'',8,7)-flavone, pongapin, 3'-methoxypongapin, pongachromene, kanugin and β -sitosterol from leaves (*J. Indian Chem. Soc.* 1985, 62, 408); two new prenylated β -diketones - pongagallone A and pongagallone B - isolated from galls of infected leaves and characterised (*Phytochemistry* 1987, 26, 281); leaf galls afforded pongapin, acrylamide and glabrin (*Fitoterapia* 1987, 58, 276); a new furanoflavone - glabone - isolated from flowers and its structure elucidated (*Phytochemistry* 1987, 26, 3373); oleic acid (57.4%) major component of seed oil; saturated fatty acids constituted 26.7% of purified oil and palmitic acid content was much higher (13.8%) than previously reported (*J. Oil Technol. Assoc. India* 1988, 20, 22; *Chem. Abstr.* 1989, 111, 12378 c); isolation of a new furanoflavone - pongone - from flowers and its structure determination (*Planta Med.* 1988, 54, 90).

NEW COMPOUNDS

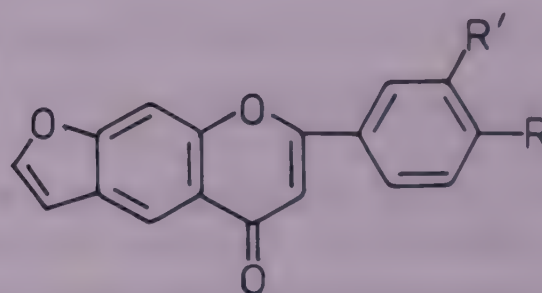


Pongagallone A

R,R' = H

Pongagallone B

RR' = -OCH₂O-



Pongone

R = H, R' = OMe

Glabone

R = OMe, R' = H

D. trifoliata Lour. syn. *D. uliginosa* Benth. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 261).

Rhamnetin-3-O-neohesperidoside isolated from leaves together with quercetin-3-O- β -D-neohesperidoside and characterised (*J. Nat. Prod.* 1986, 49, 710).

D. uliginosa Benth.; see *D. trifoliata* Lour.

DESMODIUM (Papilionaceae)

D. capitatum (Burm.f.) DC.; see *D. styracifolium* (Osbeck) Merr.

D. floribundum (D.Don) Sweet ex G.Don; see *D. multiflorum* DC.

D. gangeticum (L.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 243).

24-Ethylcholesta-5,22-dien-3 β -ol, 24-ethylcholest-5-en-3 β -ol and 24-methylcholest-5-en-3 β -ol isolated (*Indian Drugs* 1986, 23, 434).

D. multiflorum DC. syn. *D. floribundum* (D. Don) Sweet ex G. Don

Isolation of hordenine (*J. Indian Chem. Soc.* 1985, 62, 77).

Distribution : Himalayas, from Kashmir to Bhutan and Assam, alt. 1800-2600 m.

D. styracifolium (Osbeck) Merr. syn. *D. capitatum* (Burm.f.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 243).

Vicenin-1, vicenin-3 and schaftoside isolated from leaves (*Yakugaku Zasshi* 1986, 106, 517; *Chem. Abstr.* 1986, 105, 102412 q).

D. triflorum (L.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 243).

Fucosterol, vitexin and 2-O- β -D-xylosylvitexin isolated from aerial parts (*Arogya* 1984, 10, 156); 24-ethylcholesta-5,22-dien-3 β -ol, 24-ethylcholest-5-en-3 β -ol and 24-methylcholest-5-en-3 β -ol isolated (*Indian Drugs* 1986, 23, 434).

DESMOS (Annonaceae)

D. chinensis Lour. syn. *Unona discolor* Vahl (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 95).

Isolation of lysicamine, negletein, lawinal, 16-hentriacontanone, quercetin, β -sitosterol and ursolic, benzoic and salicylic acids from leaves (*Zhongcaoyao* 1988, 19, 150; *Chem. Abstr.* 1988, 109, 70407 f).

D. cochinchinensis Lour. syn. *Unona desmos* Raeusch. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 95).

Plant used in folk medicine for treatment of malaria in China. Root extract exhibited antimalarial activity.

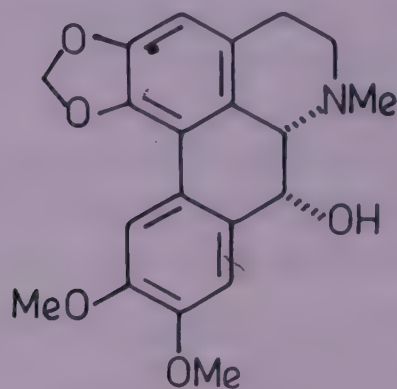
Lawinal, isounonal and 4,7-dihydroxy-5-methoxy-6-methyl-8-formylflavan isolated from roots (*Yaoxue Xuebao* 1989, 24, 110; *Chem. Abstr.* 1989, 111, 20870 x).

D. dasymaschalus (Blume) Safford var. *dasymaschalus* syn. *Unona dasymaschala* Blume

A new 7-hydroxyaporphine - dasymachaline - isolated from leaves along with dicentri-none and characterised (*Phytochemistry* 1986, 25, 1999).

Distribution : Andaman Islands.

NEW COMPOUNDS



Dasymachaline

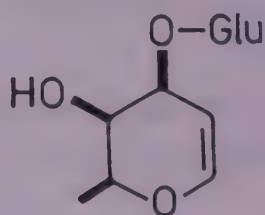
DIANTHUS (Caryophyllaceae)*D. barbatus* L.

Eng. - Sweet william.

Isolation of barbapyroside (an isomer of sapopyroside) from leaves and its structure and configuration determination (*Phytochemistry* 1986, 25, 546).

Distribution : Introduced into India and grown in gardens as ornamental.

NEW COMPOUNDS



Barbapyroside

D. caryophyllus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 244).

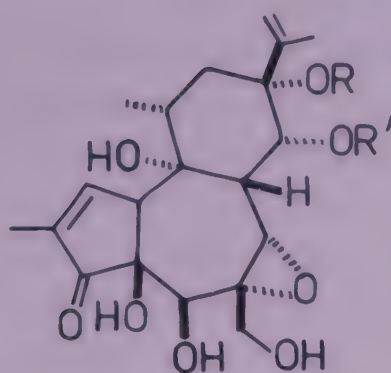
Felargonidin-3-malylglucoside isolated (*Phytochemistry* 1986, 25, 1715).

DIARTHRON (Thymelaeaceae)*D. vesiculosum* Fisch. & Mey.

Two novel daphnane diterpene esters - vesiculosin and isovesiculosin - isolated and characterised (*J. Nat. Prod.* 1985, 48, 102).

Distribution : Punjab.

NEW COMPOUNDS



Vesiculosin

$$R = H, R' = \text{CO}(\text{CH}=\text{CH})_2(\text{CH}_2)_4\text{Me}$$

Isovesiculosin

$$R = \text{CO}(\text{CH}=\text{CH})_2(\text{CH}_2)_4\text{Me}, R' = H$$

DICLIPTERA (Acanthaceae)

D. roxburghiana Nees (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 96).

Betulin, β -amyrin, β -sitosterol, stigmasterol, cetyl alcohol and palmitic, stearic, oleic, oxalic and tartaric acids, glucose, fructose, arabinose and rhamnose isolated from leaves (*Herba Pol.* 1986, 32, 71; *Chem. Abstr.* 1988, 108, 34833 n); C15-31 fatty acids, apigenin and its 7-O-glucoside, kaempferol and luteolin isolated (*Int. J. Crude Drug Res.* 1987, 25, 177).

DICRANOSTIGMA (Papaveraceae)

D. lactucoides Hook.f. & Thoms. syn. *Tylophorum lactucoides* (Hook.f. & Thoms.) Benth. & Hook.f. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 156).

Synthesis of oxysanguinarine (*Collect. Czech. Chem. Commun.* 1984, 49, 1412).

DICTAMNUS (Rutaceae)

D. albus L. syn. *D. hispanicus* Webb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 245).

Synthesis of preskimmianine and N-methylpreskimmianine (*Tetrahedron* 1984, 40, 4041); identification of robustine, dictamnine, γ -fagarine, skimmianine and haplopine in root bark (*Saengyak Hakhoechi* 1985, 16, 125; *Chem. Abstr.* 1986, 104, 174458 m); isomaculosidine synthesised (*J. Nat. Prod.* 1987, 50, 631).

BIOLOGICAL ACTIVITY

Diosmin, given orally or i.p. to rats (34.28 mg/kg/day) for five days prior to induction with ADP of respiratory distress, decreased the degree of distress by 99.0 and 42.0% respectively; it did not affect quick prothrombin time (*An. R. Acad. Farm.* 1986, 62, 681; *Chem. Abstr.* 1987, 107, 70514 x).

D. hispanicus Webb.; see *D. albus* L.

DIDYMOCARPUS (Gesneriaceae)

D. podocarpa Clarke

7,8-Epoxy-5,6-dehydrokawain isolated from whole plant and its structure determined (*J. Indian Chem. Soc.* 1986, 63, 780); aurentiacin isolated (*J. Indian Chem. Soc.* 1989, 66, 68). Distribution : Eastern Himalayas, alt. 2400-3600 m.

DIGITALIS (Scrophulariaceae)

D. lanata Ehrh. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 247).

Digoxigenin monodigitaloside isolated from leaves together with a complex mixture of cardenolides (*J. Drug Res.* 1984, 15, 245; *Chem. Abstr.* 1985, 103, 211189 b); new cardenolide - digoxigenin-3-O- β -D-digitoxosido- β -D-2,6-dideoxyglucoside - isolated from leaves and characterised (*Planta Med.* 1984, 50, 168, 265); isolation and structure elucidation of digoxigenin-3-O- β -D-digitaloside from leaves (*Planta Med.* 1984, 50, 168); isolation and characterisation of digoxigenin-3-O- β -glucodigoxoside from leaves (*Planta Med.* 1984, 50, 265); two new cardenolides - digitoxigenin-3-O- β -D-digitoxosido- β -D-xyloside and digoxigenin-3-O- β -D-digitoxosido- β -D-digitoxosido- β -D-xyloside - isolated from leaves (*Planta Med.* 1984, 50, 267); digitoxigenin-3-O-(β -D-fucopyranosido-4'- β -D-glucopyranoside) isolated from somatic embryo and characterised (*Phytochemistry* 1988, 27, 3143).

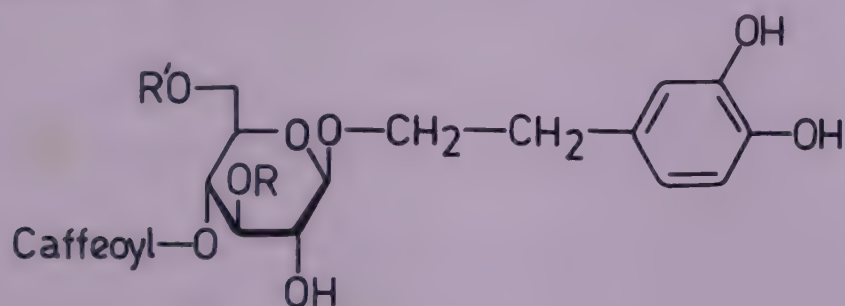
BIOLOGICAL ACTIVITY

Lanatoside C (0.4 and 0.8 mg/kg, orally) administered daily after coronary ligation lowered blood pressure, decreased heart rate and modified profoundly ECG and VCG pattern 1 hr after coronary ligation; these effects were attenuated after 7 days of drug administration (*Chinese J. Physiol.* (Taipei) 1984, 27, 45; *Chem. Abstr.* 1985, 102, 72644 k); digitoxin administered to Balb/c mouse neonates at different doses (0.333, 1.11 and 3.33 μ g/mouse, s.c.), caused vaginal epithelial differentiation by 10 days in the two low-dose groups (*Biol. Neonate* 1985, 48, 110; *Chem. Abstr.* 1985, 103, 116012 e); administration of digoxin in guinea pigs and rabbits induced immunisation in both species resulting in protection from digoxin toxicity (*Dev. Drugs Mod. Med.* 1986, 579; *Chem. Abstr.* 1987, 106, 168777 q).

D. purpurea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 249).

Isolation of desrhamnosyl acteoside, forsythiaside, purpureasides A and B and 3,4-dihydroxyphenethyl alcohol-6-O-caffeoyl- β -D-glucoside from leaves; purpureaside C and acteoside along with purpureasides A and B also isolated from callus tissue (*Phytochemistry* 1987, 26, 3225); seeds contained neutral lipids (35.0%) which consisted of hydrocarbons (4.2), sterol esters (1.1), diglycerides (5.8), triglycerides (79.9), free fatty acids (0.2) and sterols (4.8%); fatty acids of total lipid fraction comprised of C18:2 (63.2), C18:1 (19.9) and C16:0 (6.2%); sterol fraction consisted of β -sitosterol (52.0), campesterol (22.0), cholesterol (9.0) and stigmasterol (3.5%) (*Azv. Akad. Nauk Gruz. SSR, Ser. Khim.* 1988, 14, 267; *Chem. Abstr.* 1989, 111, 54162 h); digitopurpone synthesised (*Tetrahedron* 1988, 44, 1015).

NEW COMPOUNDS



Purpureaside A

R = Glu, R' = H

Purpureaside B

R = Glu, R' = Rha

Purpureaside C

R = Rha, R' = Gal

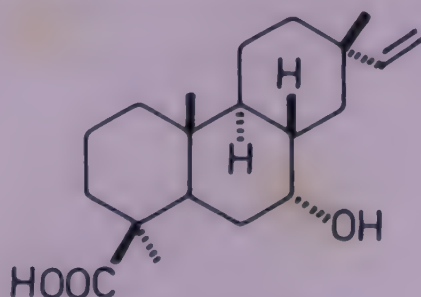
DILLENIA (Dilleniaceae)

D. floribunda Hook.f. & Thoms; see *D. pentagyna* Roxb.

D. pentagyna Roxb. syn. *D. floribunda* Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 250).

Dipoloic acid isolated from stem tissue and characterised (*Curr. Sci.* 1984, 53, 646).

NEW COMPOUNDS

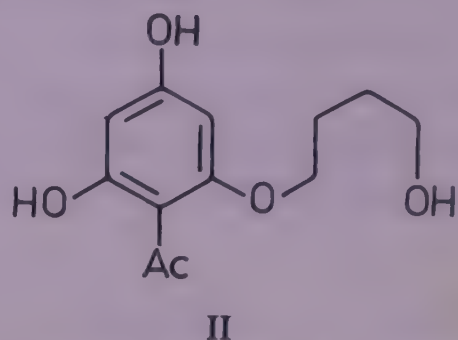
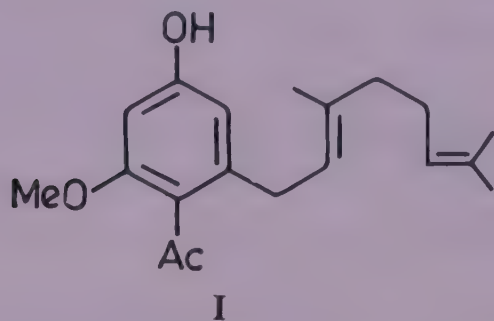


Dipoloic acid

DIOSCOREA (Dioscoreaceae)

D. bulbifera L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 251).

Two new compounds - 4-hydroxy-2-(trans 3',7'-dimethylocta-2',6'-dienyl)-6-methoxyacetophenone (I) and 4,6-dihydroxy-2-O-(4'-hydroxybutyl)acetophenone (II) - isolated and characterised (*Phytochemistry* 1989, 28, 947).

NEW COMPOUNDS

D. deltoidea Wall. ex Kunth (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 251).

Cholesterol, β -sitosterol and stigmasterol identified in rhizomes (*Rev. Pharm.* 1985, 5; *Chem. Abstr.* 1987, 107, 46136 e); deltonin, dioscin and an unidentified furostan isolated as major components from rhizomes (*Rev. Pharm.* 1985, 20; *Chem. Abstr.* 1987, 107, 46138 g).

D. floribunda Mart. & Gal. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 252).

Zeatin and its riboside identified in tubers (*Indian J. Hortic.* 1986, 43, 156; *Chem. Abstr.* 1987, 107, 93488 f).

D. japonica Thunb.

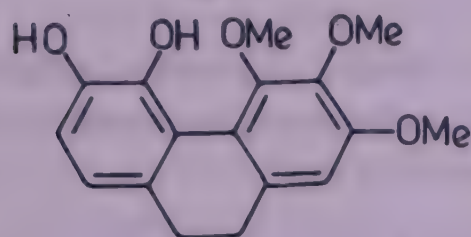
A polysaccharide composed of mannose and glucose in molar ratio of 6:1 isolated from tubers (*Chem. Pharm. Bull.* 1985, 33, 270).

Distribution : Assam.

D. prazeri Prain & Burkill (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 252).

A derivative of 9,10-dihydrophenanthrene - prazerol - isolated and its structure established (*Tetrahedron* 1988, 44, 4871); a process developed for isolation of diosgenin (*J. Indian Chem. Soc.* 1989, 66, 289).

NEW COMPOUNDS



Prazerol

DIOSPYROS (Ebenaceae)

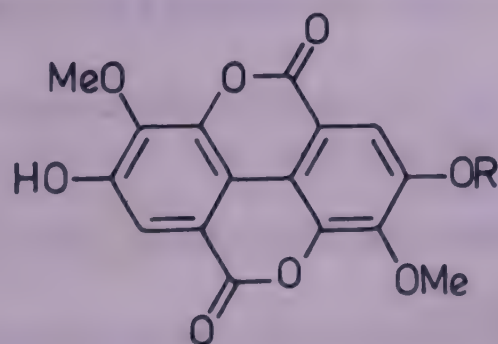
D. chloroxylon Roxb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 275).

Isolation of diospyrin, betulin and betulinic acid from roots (*Indian Drugs* 1988, 25, 211).

D. discolor Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 253).

Isolation and characterisation of 3,3'-di-O-methylellagic acid-4-O- β -D-xylopyranosyl (1 \rightarrow 4)- β -D-glucopyranoside (I) from stem bark (*Curr. Sci.* 1984, 53, 1233); lupeol, betulin and betulinic acid identified in stem bark (*Phytochemistry* 1984, 23, 1481); identification of glucose, galactose, xylose, arabinose, rhamnose and galacturonic acid in fruits (*Bangladesh J. Sci. Ind. Res.* 1984, 19, 46; *Chem. Abstr.* 1986, 104, 183342 w); isolation of 1,3,5-trihydroxy-6-methoxy-2-methylanthraquinone-8-O- β -D-glucopyranoside from stem bark and its structure elucidation (*Planta Med.* 1985, 51, 537); a new anthraquinone isolated from stem bark and characterised as 1,3,5,6-tetrahydroxy-2-methylanthraquinone-8-O- β -D-glucopyranoside (*Curr. Sci.* 1985, 54, 998); 3,3'-di-O-methylellagic acid-4-O- β -D-galactopyranosyl(1 \rightarrow 4)- β -D-glucopyranoside (II) isolated from stem bark and its structure determined (*J. Indian Chem. Soc.* 1986, 63, 1004).

NEW COMPOUNDS



I

R = Glu(4 \rightarrow 1)Xyl

II

R = Glu(4 \rightarrow 1)Gal

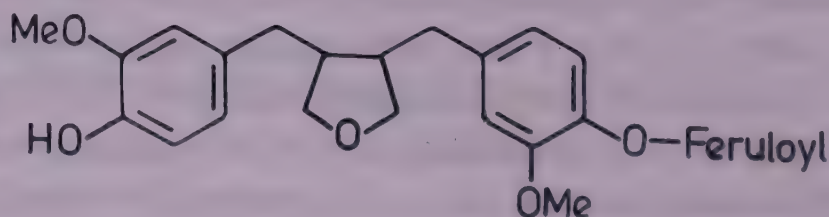
D. ebenum Koen. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 165).

Isolation of 6-hydroxy-4,5-dimethoxy-2-naphthoic acid and its methyl ester, ellagic, ursolic and betulinic acids, stigmasterol, β -sitosterol, bauermanol, betulin, α -amyrin and α -amyrenone from stem bark (*Fitoterapia* 1985, 56, 366).

D. kaki L.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 253).

Kaempferol and its 3-O-rhamnoside, 3-O-xyloside, 3-O-arabinoside, 3-O-glucoside, 3-O-galactoside and 3-O- β -D-(2''-O-galloyl)glucopyranoside, quercetin and its 3-O-arabinoside, 3-O-glucoside, 3-O-galactoside and 3-O- β -D-(2''-O-galloyl)glucopyranoside and myricetin-3-O- β -D-glucopyranoside isolated from leaves (*Kuo Li Chung-kuo I Yao Yen Chiu So Yen Chiu Pao Kao* 1984, 117; *Chem. Abstr.* 1985, 102, 59364 z); isolation of a new lignan - (-)-divanillyltetrahydrofuran ferulate - from calyxes and its structure elucidation (*Phytochemistry* 1985, 24, 626); kaempferol, its 3-O- β -D-glucopyranoside and isoquercitrin identified in leaves (*Khim. Prir. Soedin.* 1985, 710; *Chem. Abstr.* 1986, 104, 106233 j); identification of β -carotene and lycopene as major carotenoids in fruits (*Khim. Prir. Soedin.* 1987, 456; *Chem. Abstr.* 1987, 107, 172487 h); campesterol, stigmasterol, β -sitosterol, uvaol and betulinic, ursolic and oleanolic acids isolated from leaves (*Chung-hua Yao Hsueh Tsa Chih* 1988, 40, 195; *Chem. Abstr.* 1989, 111, 20839 u).

NEW COMPOUNDS



(-)-Divanillyltetrahydrofuran ferulate

D. lotus L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 276).

Lupeol, betulin, betulinic acid, 7-methyljuglone, rotundiquinone and neodiospyrin isolated from fruits (*Phytochemistry* 1984, 23, 1481).

D. montana Roxb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 278).

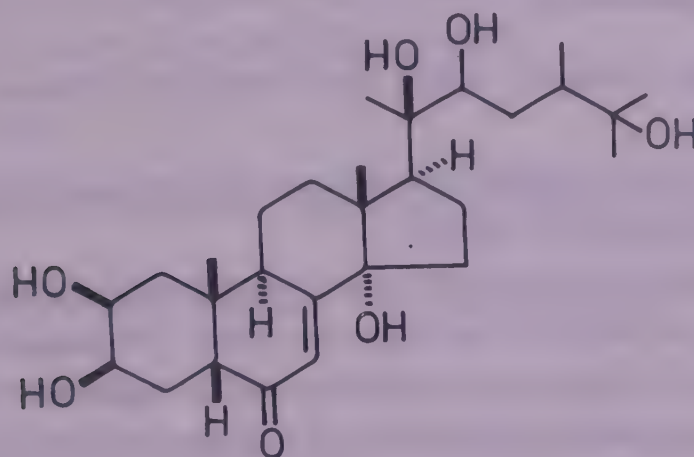
Bark extract inhibited growth of Ehrlich ascites carcinoma in mice (*J. Indian Chem. Soc.* 1981, 58, 627).

8-Hydroxyoctadec-10(Z)-enoic acid (5.4%) determined in seed oil (*Indian J. Chem.* 1987, 26B, 283).

DIPLOCLISIA (Menispermaceae)

D. glaucescens (Bl.) Diels syn. *Cocculus macrocarpus* W. & A. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 280).

A new phytoecdysteroid - 24-epimakisterone A - isolated from seeds and characterised; 20-hydroxyecdysone, makisterone A, 24(28)-dehydromakisterone A and pterosterone also isolated (*Planta Med.* 1985, 51, 40); stigmasterol and ecdysterone (3.0%) isolated from stem (*Phytochemistry* 1989, 28, 1073).

NEW COMPOUNDS

24-Epimakisterone A

BIOLOGICAL ACTIVITY

Ecdysterone showed moderate insecticidal activity (LD₅₀ 1.8 mg/kg against *Aphis craccivora*) and caused 100.0% immotility of human spermatozoa at 20.0 mg/ml within 20 sec. It also showed potent froth forming and haemolytic activities (*Phytochemistry* 1989, 28, 1073).

DIPLOKNEMA (Sapotaceae)

D. butyracea (Roxb.) Lamk.; see *Madhuka butyracea* (Roxb.) Macbride

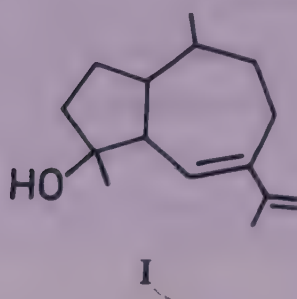
DIPTEROCARPUS (Dipterocarpaceae)*D. kerri* King

The resin showed termiticidal and fungicidal activities.

A new sesquiterpene (I) isolated from resin along with spathulenol, epicyclocolorenone and α -gurjunene; new compound characterised (*J. Chem. Ecol.* 1989, 15, 731; *Chem. Abstr.* 1989, 111, 74794 u).

Distribution : Andaman Islands.

NEW COMPOUNDS

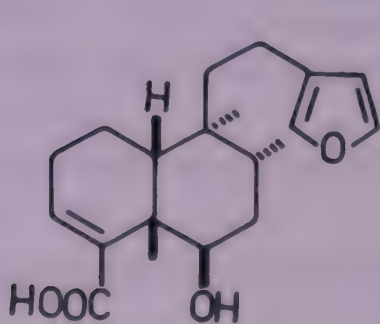
**DODONAEA** (Sapindaceae)

D. viscosa (L.) Jacq. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 256).

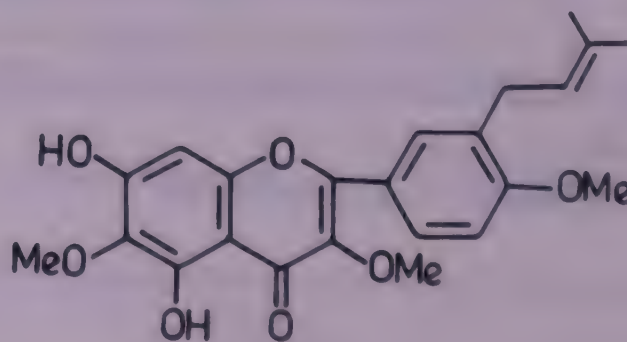
The saponin mixture exhibited antiexudative, phagocytosis- enhancing and molluscicidal activities (*Phytochemistry* 1987, 26, 697).

A new diterpenoid - dodonic acid - isolated from aerial parts and its structure determined (*Planta Med.* 1984, 50, 448); two novel prosapogenins - R1 barrigenol-21,22-diangelate and jegosapogenol-21-(2,3-dihydroxy-2-methylbutyroyl)-22-angelate - isolated from stem bark together with R1 barrigenol and jegosapogenol and characterised (*Bull. Soc. Chim. Belg.* 1985, 94, 141; *Chem. Abstr.* 1985, 103, 19800 c); isolation of a new flavonoid - viscosol - from aerial parts and its structure determination (*Phytochemistry* 1986, 25, 1967); two saponins - dodonosides A and B - isolated from seeds; both contained R1 barrigenol as the aglycone esterified at C-21 and C-22 and bearing α -L-arabinofuranosyl(1 \rightarrow 2 or 3)-[β -D-galacto-pyranosyl(1 \rightarrow 2 or 3)]- β -D-glucuronopyranose moiety at C-3 hydroxy group; in dodonoside A aglycone was esterified with 2,3-dimethyloxiran-2-carboxylic acid and 2-methylbutyric acid whereas in dodonoside B it was esterified with 2,3-dimethyloxiran-2-carboxylic acid and angelic acid (*Phytochemistry* 1987, 26, 697); stigmasterol, 21,22-diangeloylbarringtonenol C, 21,22-diangeloyl-R1 barrigenol, 21-angeloyl-R1 barrigenol and cleomiscosin A isolated from stem (*Fitoterapia* 1987, 58, 361); isorhamnetin and quercetin isolated from root bark (*Indian J. Nat. Prod.* 1988, 4(2), 12; *Chem. Abstr.* 1989, 110, 228632 h).

NEW COMPOUNDS



Dodonic acid



Viscosol

DOLICHANDRONE (Bignoniaceae)

D. platycalyx Baker; see *Markhamia platycalyx* (Baker) Sprague

DOLICHOS (Papilionaceae)

D. falcatus Klein ex Willd.; see *D. trilobus* L.

D. trilobus L. syn. *D. falcatus* Klein ex Willd. (*falcata*) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 257).

A saponin isolated from roots and characterised as medicagenic acid-3-O- β -D-glucoside (*Zhongcaoyao* 1985, 16, 47; *Chem. Abstr.* 1985, 102, 225901 u).

DORONICUM (Asteraceae)

D. pardalianches L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 282).

Isolation of otosenine from roots (*Indian J. Chem.* 1985, 24B, 882).

DORYALIS (Flacourtiaceae)

D. caffra Warb. syn. *Aberia caffra* Harv. & Sond.

Eng. - Kei apple.

Linoleic (48.1), palmitic (25.9), oleic (19.3), stearic (3.9), arachidic (1.2), myristic (0.9), behenic (0.5) and lauric (0.2%) acids determined in seed oil (*Fette Seifen Anstrichm.* 1985, 87, 196; *Chem. Abstr.* 1985, 103, 34909 p).

Distribution : Introduced into India.

DRACOCEPHALUM (Lamiaceae)

D. nutans L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 282).

Pinocamphone (56.4), isopinocamphone (4.3), isopinocampheol (3.7), β -pinene (12.7) and α -phellandrene (4.6%) determined in oil by GC-MS (*Planta Med.* 1988, 54, 165).

D. royleanum Benth.; see *Lallemantia royleana* (Wall. ex Benth.) Benth.

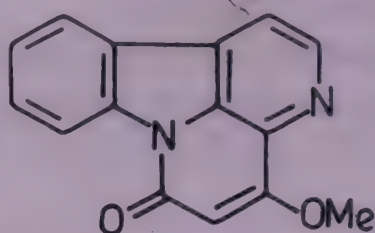
DREGEA (Asclepiadaceae)

D. volubilis (L.f.) Benth. ex Hook.f.; see *Wattakaka volubilis* (L.f.) Stapf

DRYMARIA (Caryophyllaceae)

D. cordata (L.) Willd. ex Roem. & Schult. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 102).

Cordatanine isolated and its structure determined (Zhiwu Xuebao 1986, 28, 450; *Chem. Abstr.* 1987, 106, 15732 w); palmitic, succinic and p-hydroxycinnamic acids and α -spinasterol detected in Chinese plant (*Zhongyao Tongbao* 1987, 12, 36; *Chem. Abstr.* 1987, 106, 135344 t).

NEW COMPOUNDS

Cordatanine

DRYOPTERIS (Dryopteridaceae)

D. crenata (Forsk.) Ktze.; see *Hypodematium crenatum* (Forsk.) Kuhn

D. filix-mas (L.) Schott (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 258).

Plant extract showed antiviral activity against vesicular stomatitis virus in monkey cell culture (*Ann. Pharm. Fr.* 1986, 44, 41; *Chem. Abstr.* 1986, 105, 108018 n).

DUBOISIA (Solanaceae)

D. myoporoides R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 259).

A new hydroxyketone - 8-hydroxydotriacontan-30-one - isolated along with betulonic acid, tetratriacontanoic acid and dotriacontanol and structure of new compound determined (*Phytochemistry* 1984, 23, 1516).

DUCHESNEA (Rosaceae)

D. indica (Andr.) Focke; see *Fragaria indica* (Andr.) Wolf.

DYSOPHYLLA (Lamiaceae)

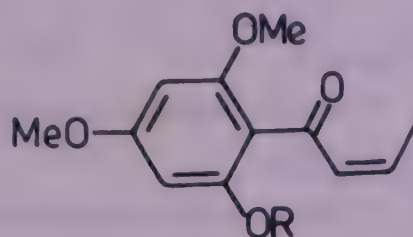
D. auricularia (L.) Blume; see *Pogostemon auricularis* (L.) Hassk.

D. verticillata Benth.

Two new phenylbutenone derivatives - vertinone and verticilone - isolated and characterised (*Phytochemistry* 1988, 27, 3683).

Distribution : Bihar eastwards to Assam.

NEW COMPOUNDS



Vertinone

R = Me

Verticilone

R = H

DYSOSMA (Podophyllaceae)

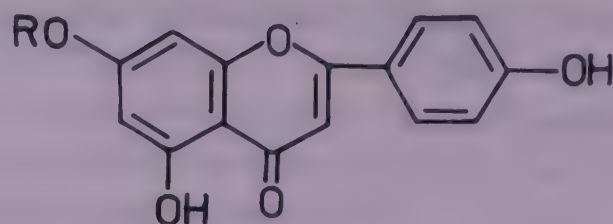
D. aurantiocaula (Hand.-Mazz.) Hu; see *Podophyllum aurantiocaula* Hand.-Mazz.

ECHINOPS (Asteraceae)

E. echinatus Roxb. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 171).

A new acylated flavone - apigenin-7-O- β -D-(4''-cis-p-coumaroyl)glucoside - isolated together with apigenin-7-O-glucoside and characterised (*Phytochemistry* 1986, 25, 1770); isolation and structure elucidation of echinacin and echinaticin (*Chem. Ind.* 1986, 713); a new alkaloid - echinozolinone - isolated along with echinopsine and echinopsidine and its structure determined (*Phytochemistry* 1987, 26, 587); n-hentriacontane, n-hentriacontanol, lupeol and its acetate, β -amyrin and its acetate, β -sitosterol, palmitic acid, betulinic acid, apigenin, its 7-O-glucoside and 7-O- β -D-(4''-p-coumaroyl)glucoside, luteolin, quercetin and echinopsine identified in flowers (*Fitoterapia* 1986, 59, 150); allophanic acid and ω -methylallophanic acid from roots (*J. Indian Chem. Soc.* 1988, 65, 69); α - and β -amyrin acetates, β -amyrin caproate, betulinic acid, lupeol acetate, ethyl palmitate, apigenin, β -sitosterol and its acetate isolated from twigs (*Orient. J. Chem.* 1988, 4, 334; *Chem. Abstr.* 1989, 110, 21142 c).

NEW COMPOUNDS

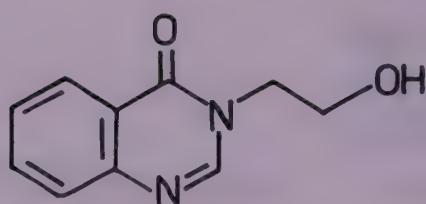


Echinacin

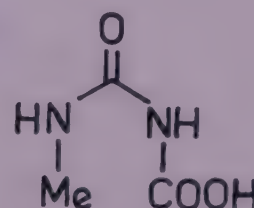
R = Glu(6''-p-hydroxycinnamoyl)

Echinaticin

R = Glu(4''-p-hydroxycinnamoyl)



Echinosolinone



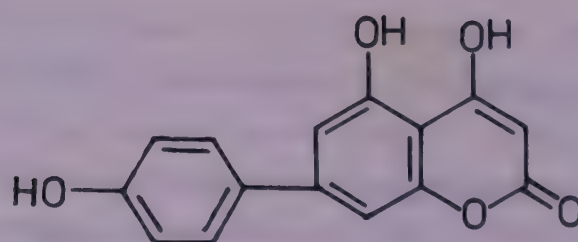
ω-Methylallophanic acid

E. niveus Wall. ex DC.

A new coumarin - nivegin - isolated (*Chem. Ind.* 1987, 828); structure of nivegin revised by synthesis (*Tetrahedron* 1989, 45, 1839).

Distribution : Himalayas from Kashmir to Garhwal, alt. 1200-2700 m.

NEW COMPOUNDS



Nivegin

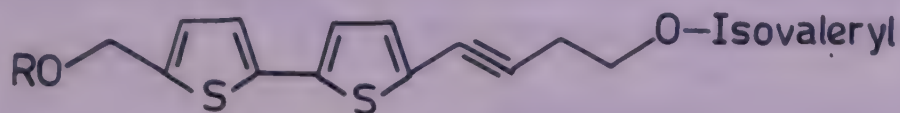
ECLIPTA (Asteraceae)

E. alba (L.) Hassk. syn. *E. erecta* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 260).

A new dithienylacetylene ester (I) isolated from roots and characterised as 5'-isovaleryl-oxymethylene-2-(4-isovaleryloxybut-3-ynyl)dithiophene (*Phytochemistry* 1985, 24, 615; *Bioact. Mol.* 1988, 7, 179; *Chem. Abstr.* 1989, 110, 228600 w); isolation and structure determination of 5'-seneciolyloxymethylene-2-(4-isovaleryloxybut-3-ynyl)dithiophene (II) (*Indian J. Chem.* 1988, 27B, 99; *Bioact. Mol.* 1988, 7, 179; *Chem. Abstr.* 1989, 110, 228600 w); in addition

5'-tigloyloxymethylene-2-(4-isovaleryloxybut-3-ynyl)dithiophene (III) isolated from aerial parts and roots and its structure elucidated (*Bioact. Mol.* 1988, 7, 179; *Chem. Abstr.* 1989, 110, 228600 w).

NEW COMPOUNDS



I

R = Isovaleryl

II

R = Senecieryl

III

R = Tigloyl

E. erecta L.; see *E. alba* (L.) Hassk.

EDGEWORTHIA (Thymelaeaceae)

E. gardneri (Wall.) Meissn. syn. *E. tomentosa* Nakai (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991 p. 289).

Daphnoretin and 7-O-acetyldaphnoretin isolated (*Phytochemistry* 1986, 25, 557); two new coumarins isolated and characterised as 7-ethoxy-3,4-dimethylcoumarin and 5-methoxy-4-methylcoumarin (*Indian J. Chem.* 1987, 26B, 81).

E. tomentosa Nakai; see *E. gardneri* (Wall.) Meissn.

ELAEAGNUS (Elaeagnaceae)

E. angustifolia L. syn. *E. hortensis* M. Bieb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 290).

Ethyl trans-cinnamate as major component along with 3-methylhexanal, benzaldehyde, n-nonanal, n-decanal, ethyl benzoate, ethyl phenylacetate, 7-methyl-6-tridecene, ethyl cis-cinnamate, methyl cinnamate, isopropyl cinnamate, n-heptadecane, n-heneicosane, octacosane, 4-methyl-1-phenyl-1-penten-3-one, 6,10,14-trimethyl-2-pentadecanone, palmitic acid, ethyl palmitate, ethyl oleate, ethyl stearate and ethyl arachidate identified in floral oil by GC-MS (*Youji Huaxue* 1986, 301; *Chem. Abstr.* 1987, 106, 153106 w); caffeic acid, isorhamnetin and its 3-O- β -D-galactoside isolated from fruits (*Khim. Prir. Soedin.* 1988, 455; *Chem. Abstr.* 1988, 109, 208313 f); gallic, caffeic, p-coumaric, sinapic, ferulic, ellagic and chlorogenic acids identified (*Herba Pol.* 1988, 34, 115; *Chem. Abstr.* 1989, 111, 211980 t).

E. hortensis M. Bieb.; see *E. angustifolia* L.

ELAEIS (Arecaceae)

E. quineensis Jacq. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 105).

Wax esters from exocarp oil found to be composed of C16-28 fatty acids and C16-34 fatty alcohols by GC-MS (*Phytochemistry* 1988, 27, 877).

ELAEOCARPUS (Elaeocarpaceae)

E. ganitrus Roxb. ex G.Don; see *E. sphaericus* (Gaertn.) K. Schum.

E. sphaericus (Gaertn.) K. Schum. syn. *E. ganitrus* Roxb. ex G.Don (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 262).

Elaeocarpidine synthesised (*J. Org. Chem.* 1988, 53, 3164).

ELAEODENDRON (Celasteraceae)

E. glaucum (Rottb.) Pers.; see *Cassine glauca* (Rottb.) Kuntze

ELETTARIA (Zingiberaceae)

E. cardamomum (L.) Maton syn. *Amomum compactum* Roem. & Schult. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 262).

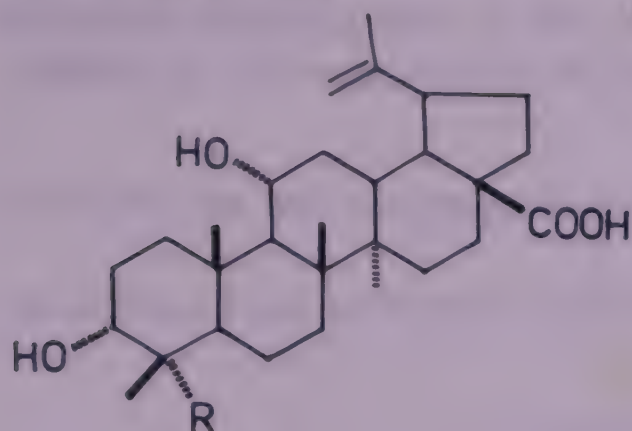
α -Terpineol (44.84), myrcene (27.14%), 1,8-cineole, heptane, limonene, menthone, β -phellandrene, α - and β -pinenes and sabinene present in volatile oil (*Pharmazie* 1987, 42, 207; *Chem. Abstr.* 1987, 107, 12641 a); (+)(S)nerolidol identified in essential oil (*Chem. Ind.* 1988, 587); 1,8-cineole and α -terpinyl acetate as major and limonene, sabinene and α -terpineol as minor components in oil variety α -minor (*Dev. Food Sci.* 1988, 18, 697; *Chem. Abstr.* 1988, 109, 187288 j).

ELEUTHEROCOCCUS (Araliaceae)

E. trifolius (L.) Hu syn. *Acanthopanax aculeatum* (Ait.) Seem., *A. trifolius* (L.) Merr. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 292).

Two new triterpenoid carboxylic acids isolated from leaves and characterised as $3\alpha,11\alpha$ -dihydroxylup-20(29)-en-28-oic acid (I) and $3\alpha,11\alpha,23$ -trihydroxylup-20(29)-en-28-oic acid (II) (*Phytochemistry* 1984, 23, 2889); isolation and structure determination of $3\alpha,11\alpha$ -dihydroxy-23-oxo-lup-20(29)-en-28-oic acid (III) (*Phytochemistry* 1985, 24, 867); two new nortriterpenes - 24-nor- $3\alpha,11\alpha$ -dihydroxylup-20(29)-en-28-oic acid (IV) and 24-nor- 11α -hydroxy-3-oxolup-20(29)-en-28-oic acid (V) - obtained and their structures elucidated by X-ray analysis (*Phytochemistry* 1985, 24, 2355; *Croat. Chem. Acta* 1985, 55, 427; *Chem. Abstr.* 1986, 105, 227067 n).

NEW COMPOUNDS



I

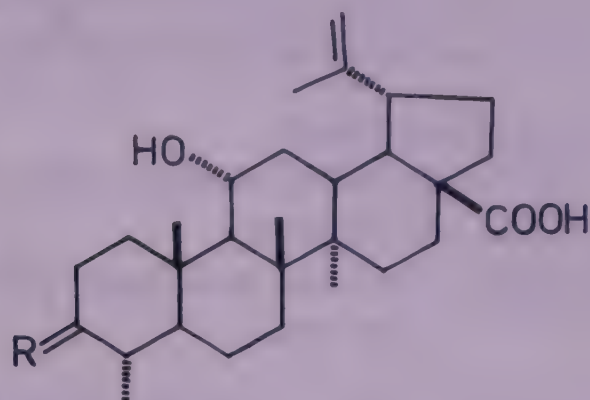
R = Me

II

R = CH₂OH

III

R = CHO



IV

R = α -OH, H

V

R = O

ELSHOLTZIA (Lamiaceae)*E. blanda* (Benth.) Benth.

Assam - Bantuluki, Bantulsi.

Linalool, trans-linalool oxide, 1,8-cineole, acetophenone, camphor and borneol identified in essential oil (*Yunnan Zhiwu Yanjiu* 1989, 11, 91; *Chem. Abstr.* 1989, 111, 93933 e).

Distribution : Himalayas, Nepal to Sikkim, Meghalaya and hills of Bihar, alt. 600-1800 m.

E. ciliata (Thunb.) Hyland. syn. *E. cristata* Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 106).

Apigenin and its 7-O-glucoside, luteolin-7-O-glucoside and linarin isolated (*Arch. Pharmacol Res.* 1988, 11, 247; *Chem. Abstr.* 1989, 110, 92119 m).

E. cristata Willd.; see *E. ciliata* (Thunb.) Hyland.

E. fruticosa (D.Don) Rehder syn. *E. polystachya* Benth. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 292).

Determination of 1,8-cineole (26.11), 1,4-cineole (20.04), neryl acetate (10.12), perillaldehyde (7.24), β -caryophyllene (2.56) and geranyl acetate (2.14%) in essential oil of leaves by GC-MS; γ -bisabolene, δ - and γ -cadinenes, camphene, calamenene, δ -car-3-ene, citronellyl acetate, α -p-dimethylstyrene, β -elemene, β -farnesene, α -gurjunene, irridomyrmecin, linalyl acetate, α -longipinene, myrcene, myrtenol, cis-ocimene, α - and β -pinenes, sabinene, san-

talene, terpinen-4-ol, α -terpinyl acetate, γ -terpinene, α -thujene and α -ylangene identified as minor components in essential oil (*Phytochemistry* 1988, 27, 1065); 1,8-cineole identified in essential oil of leaves by GLC (*Indian Perfum.* 1984, 28, 71; *Chem. Abstr.* 1985, 102, 128885 j).

E. pilosa (Benth.) Benth.

1,8-Cineole (50.0%) identified in oil by GC-MS (*Z. Naturforsch.* 1988, 43C, 370; *Chem. Abstr.* 1988, 109, 115838 r).

Distribution : Himalayas from Kashmir to Sikkim, alt. 1500-2500 m and Khasi Hills alt. 1200-1800 m.

E. polystachya Benth.; see *E. fruticosa* (D.Don) Rehder

E. strobilifera Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 263).

Fifty mono- and sesquiterpenoids identified in essential oil; pinocarvone found to be most abundant compound (*Planta Med.* 1985, 51, 412).

EMBLICA (Euphorbiaceae)

E. officinalis Gaertn. syn. *Phyllanthus emblica* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 263).

Dry powdered pulp of fruits (1.0 g/kg) reduced levels of serum, aortic and hepatic cholesterol significantly in rabbits but did not influence euglobulin clot lysis time, platelet adhesiveness or serum triglyceride levels (*Experientia* 1985, 41, 423); fruit extract reduced significantly sodium azide and 4-nitro-O-phenylenediamine-induced histamine revertants in TA 100 and TA 97a strains respectively of *Salmonella typhimurium*. Enhanced inhibitory activity of extract on pre-incubation suggests the presence desmutagens in extract (*Indian J. Exp. Biol.* 1989, 27, 207).

Tannin from bark found to have 2,3-cis configuration and to be a mixture of partially 3-O-gallated prodelphinidin and procyanidin (*Linchan Huaxue Yu Gongye* 1987, 7, 20; *Chem. Abstr.* 1988, 109, 3767 k).

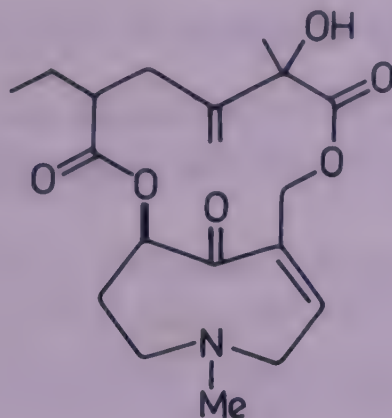
EMILIA (Asteraceae)

E. flammea Cass.; see *E. javanica* (Burm.f.) C.B. Robinson

E. javanica (Burm.f.) C.B. Robinson syn. *E. sagittata* DC., *E. flammea* Cass. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 293).

Structure of emiline revised (*Phytochemistry* 1987, 26, 2430).

NEW COMPOUNDS



Emiline

E. sagittata DC.; see *E. javanica* (Burm.f.) C.B. Robinson

E. sonchifolia DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 263).

Senkirkine and doronine isolated from aerial parts (*Planta Med.* 1986, 52, 484).

ENGELHARDTIA (Juglandaceae)

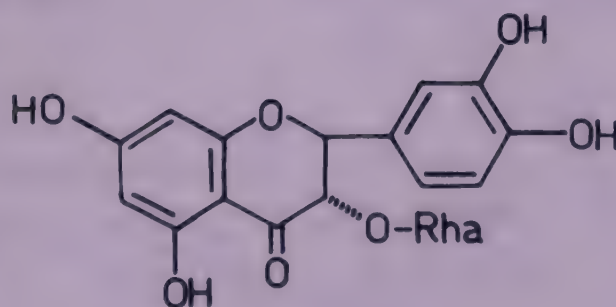
E. chrysolepis Hance; see *E. roxburghiana* Wall.

E. polystachya Radlk.; see *E. roxburghiana* Wall.

E. roxburghiana Wall. syn. *E. polystachya* Radlk., *E. wallichiana* Lindl. ex C. DC., *E. chrysolepis* Hance (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 107).

Two diastereomers - astilbin and neoastilbin - isolated from leaves together with eucryphin and quercitrin (*Chem. Pharm. Bull.* 1988, 36, 4167).

NEW COMPOUNDS



Neoastilbin

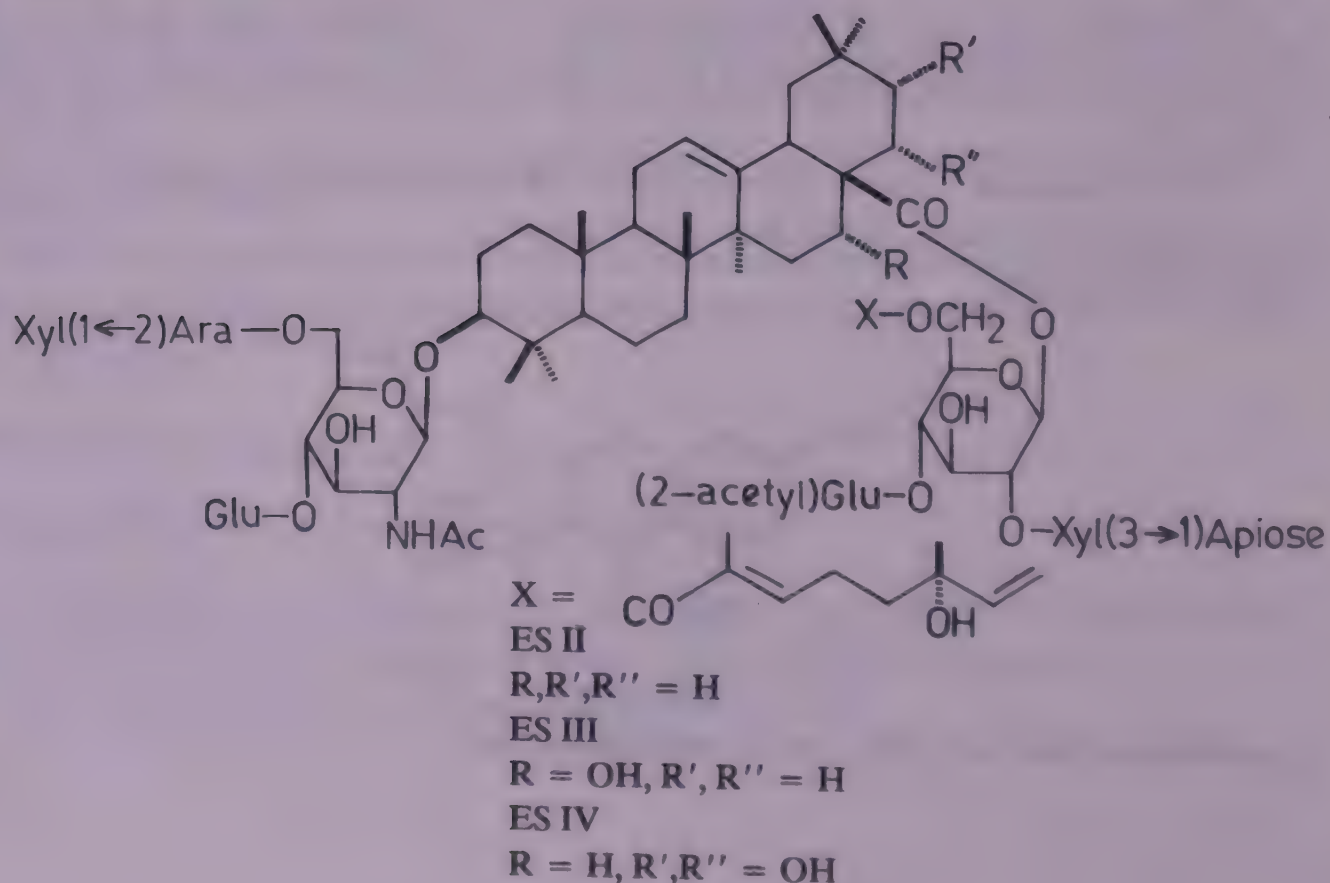
E. wallichiana Lindl. ex C. DC.; see *E. roxburghiana* Wall.

ENTADA (Mimosaceae)

E. phaseoloides (L.) Merr.; see *E. pursaetha* DC. ssp. *pursaetha*

E. pursaetha DC. ssp. *pursaetha* syn. *E. phaseoloides* auct. [non (L.) Merr.], *E. scandens* auct. [non (L.) Benth.] p.p. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 264).

A new sulphur-containing amide - entadamide A - isolated from seeds and characterised (*Chem. Pharm. Bull.* 1985, 33, 5153; *Phytochemistry* 1987, 26, 1525); in addition, entadamide B also isolated from seeds and its structure determined (*Phytochemistry* 1987, 26, 1525); two new Entada saponins - ES II and ES IV - isolated from bark and characterised as 3-O- $[\beta$ -D-xylopyranosyl(1 \rightarrow 2) α -L-arabinopyranosyl(1 \rightarrow 6)][β -D-glucopyranosyl(1 \rightarrow 4)]-2-acetamido-2-deoxy- β -D-glucopyranosyl-28-O- $[\beta$ -D-apiofuranosyl(1 \rightarrow 3)- β -D-xylopyranosyl(1 \rightarrow 2)][2-O-acetyl]- β -D-glucopyranosyl(1 \rightarrow 4)]-6-O-[6(R)6-hydroxy-2,6-dimethyl-2(E)2,7-octadienoyl]- β -D-glucopyranosyl-oleanolic acid and -entagenic acid respectively (*Chem. Pharm. Bull.* 1988, 36, 1264); Entada saponin ES III isolated from bark and characterised as echinocystic acid bearing same carbohydrate moieties as in case of ES II and ES IV (*Phytochemistry* 1987, 26, 2789); isolation and structure determination of a homogentisic acid glucoside - phaseoloidin - from seeds (*Phytochemistry* 1988, 27, 3259); a new amide - entadamide C - isolated from leaves along with entadamide A; its structure and absolute configuration determined and confirmed by synthesis (*Phytochemistry* 1989, 28, 881).

NEW COMPOUNDS



(trans)

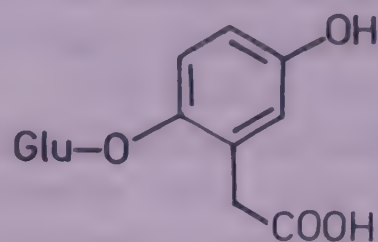
Entadamide A



Entadamide C



Entadamide B



Phaseoloidin

E. scandens (L.) Benth.; see *E. pursaetha* DC. ssp. *pursaetha*

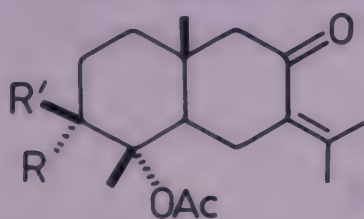
EPALTES (Asteraceae)

E. divericata (L.) Cass.

A new eudesmane derivative (I) isolated and characterised as 3 α -angeloyloxy-4 α -acetoxy-8-oxoeudesm-7(10)-ene along with four closely related eudesmane derivatives (II, III, IV and V) (*Phytochemistry* 1987, 26, 569).

Distribution : Peninsular India.

NEW COMPOUNDS

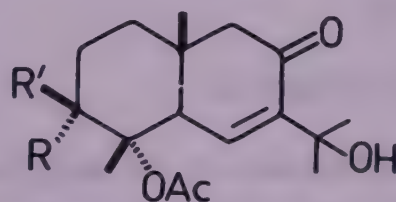


I

R = Angeloyloxy, R' = H

II

R = H, R' = Angeloyloxy

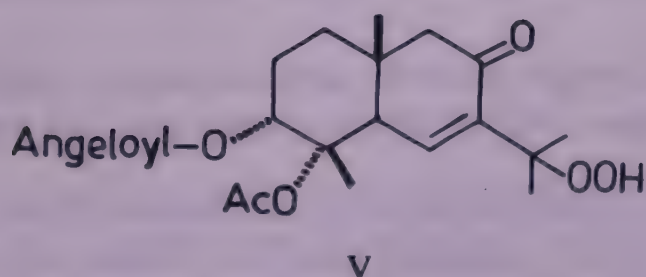


III

R = H, R' = Angeloyloxy

IV

R = Angeloyloxy, R' = H



V

EPHEDRA (Ephedraceae)

E. intermedia Schrenk & Mey. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 265).

BIOLOGICAL ACTIVITY

Ephedrine exhibited intense CNS stimulatory activity while (+)pseudoephedrine showed weaker effect. Ephedrine contracted vas deferens and potentiated the effect of norepinephrine in autonomic nervous system; it elicited marked antihistaminic and antitubercular activities (*J. Ethnopharmacol.* 1985, 13, 175; *Chem. Abstr.* 1985, 103, 189213 f); ephedrine and pseudoephedrine inhibited hind-paw oedema induced by histamine, serotonin, bradykinin and PGE1 in sham-operated mice as well as in adrenalectomised mice. Anti-inflammatory activity of pseudoephedrine was reduced by previous treatment with reserpine indicating that anti-inflammatory activity of ephedrine and pseudoephedrine are partly mediated via sympathetic nervous system (*Planta Med.* 1985, 51, 325); relaxant activity of (-)ephedrine, ephedrine and (+)pseudoephedrine studied *in vitro* on isolated guinea pig trachea and *in vivo* on bronchoconstriction induced by acetylcholine in conscious guinea pigs and found to be due to stimulation of β -adrenoceptors (*Ann. Pharm. Fr.* 1985, 43, 31; *Chem. Abstr.* 1985, 103, 153774 a); ephedrine (3.1-50.0 mg/kg, i.p.) decreased food intake in rats; this anorectic effect decreased by pretreatment with pimoxido (*Gen. Pharmacol.* 1987, 18, 559; *Chem. Abstr.* 1987, 107, 127097 v).

EPIGENEUM (Orchidaceae)

E. fuscescens (Griff.) Summ. syn. *Dendrobium fuscescens* Griff.

A new phenolic ester - defuscin - isolated and characterised as n-triacontyl p-coumarate; isolation and conformation of shikimic acid (*Phytochemistry* 1989, 28, 290).

Distribution : Sikkim, Meghalaya and Nagaland, alt. 1200-2100 m.

EPILOBIUM (Onagraceae)

E. angustifolium L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 265).

Sitosterol, its glucoside, 6-acyl glucoside, palmitate, caprate, caprylate, caproate and propionate isolated (*Sci. Pharm.* 1985, 53, 39; *Chem. Abstr.* 1985, 103, 34888 f).

E. parviflorum Schreb. syn. *E. parviflorum* Schreb. var. *vestitum* Clarke

Methanol and water extracts stimulated membrane oxidase and myeloperoxidase of human granulocytes (*Herba Pol.* 1987, 33, 179; *Chem. Abstr.* 1988, 109, 187326 v).

Sitosterol, its glucoside, palmitate, caprate, caprylate, caproate and propionate isolated (*Sci. Pharm.* 1985, 53, 39; *Chem. Abstr.* 1985, 103, 34888 f); palmitic, palmitoleic, stearic, oleic,

arachidonic, linoleic and linolenic acids, β -sitosterol, quercetin-3-rhamnolactoside and glycosides of kaempferol and myricetin isolated from aerial parts (*Herba Pol.* 1987, 33, 179; *Chem. Abstr.* 1988, 109, 187326 v).

Distribution : Himalayas from Kashmir to Nepal, alt. 1800-3200 m.

E. parviflorum Schreb. var. *vestitum* Clarke; see *E. parviflorum* Schreb.

EQUISETUM (Equisetaceae)

E. arvense L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 266).

β -Sitosterol (60.0), campesterol (32.9), isofucosterol (5.9%) and cholesterol (tr) determined in sterol fraction by HPLC (*Boll. Soc. Ital. Biol. Sper.* 1984, 60, 2241; *Chem. Abstr.* 1985, 102, 109852 e).

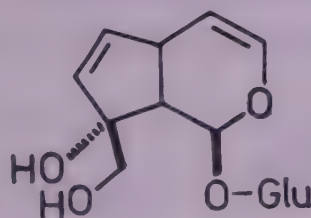
ERANTHEMUM (Acanthaceae)

E. pulchellum Andr. syn. *Daedalacanthus nervosus* (Vahl) T. Ander.

A new iridoid glucoside - eranthemoside - isolated along with betaine and its structure determined (*Phytochemistry* 1987, 26, 3353).

Distribution : Punjab to Bhutan, alt. 300-900 m and Sunderbans in West Bengal.

NEW COMPOUNDS



Eranthemoside

ERECHTITES (Asteraceae)

E. valerianifolia (Wolf) DC.; see *Crassocephalum crepidioides* (Benth.) Moore

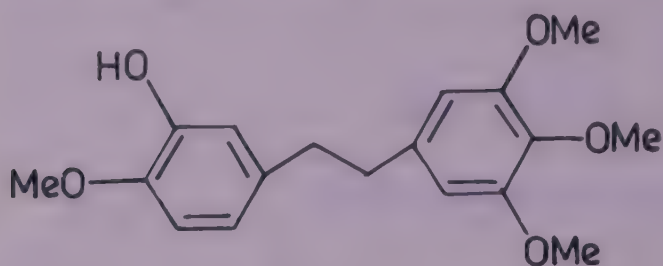
ERIA (Orchidaceae)

E. carinata Gibbs.

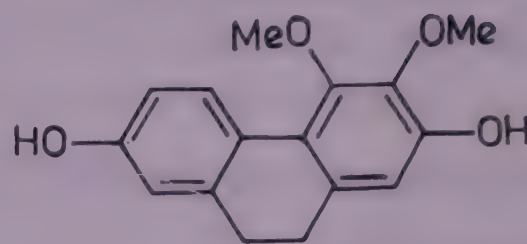
A new bibenzyl derivative - erianin - isolated and its structure elucidated (*Indian J. Chem.* 1984, 23B, 1040); isolation and structure determination of erianthrindin (*Indian J. Chem.* 1985, 24B, 1192); an amorphous phenanthrene - nudol - isolated and characterised (*Phytochemistry* 1985, 24, 801).

Distribution : Himalayas, Nepal eastwards, alt. 1000-1500 m.

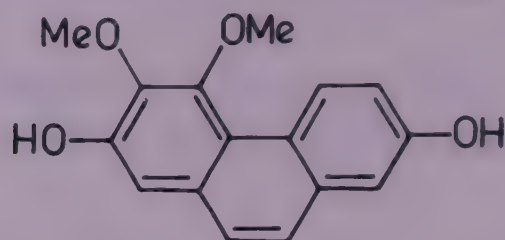
NEW COMPOUNDS



Erianin



Erianthridin



Nudol

E. convallarioides Lindl.; see *E. spicata* (D.Don) Hand.-Mazz.

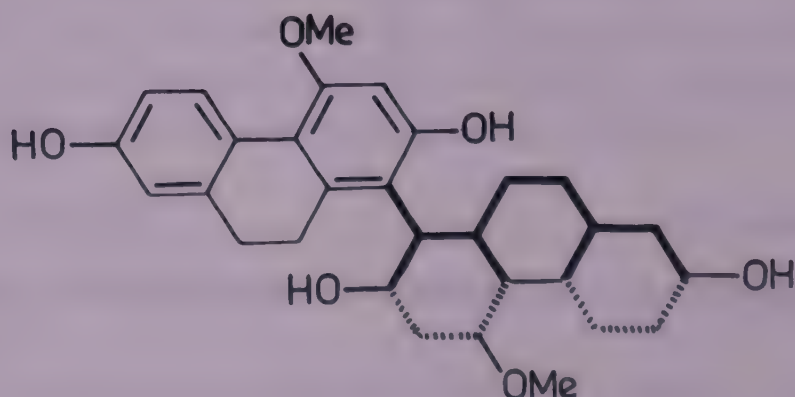
E. flava Lindl.; see *E. pubescens* (Hook.) Lindl. ex Steud.

E. pubescens (Hook.) Lindl. ex Steud. syn. *E. flava* Lindl.

A new 9,10-dihydrophenanthrene derivative - flavanthrin - isolated along with coelonin and its structure elucidated (*Tetrahedron* 1988, 44, 7303).

Distribution : Himalayas, from Garhwal to Arunachal Pradesh.

NEW COMPOUNDS



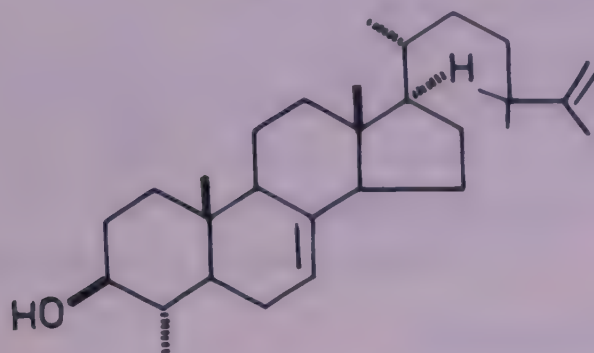
Flavanthrin

E. spicata (D.Don) Hand.-Mazz. syn. *E. convallarioides* Lindl.

Isolation and structure determination of a new 4 α -methylsterol - erianol; nudol, erianthridin and sitosterol also isolated (*Phytochemistry* 1989, 28, 1487).

Distribution : Himalayas from Kumaon to Sikkim, Khasia Hills in Meghalaya and hills of Nagaland, alt. 1200-1900 m.

NEW COMPOUNDS



Erianol

E. stricta Lindl.

Isolation of erianthridin (*Indian J. Chem.* 1985, 24B, 1192); nudol isolated (*Phytochemistry* 1985, 24, 801).

Distribution : Himalayas, Nepal eastwards and Meghalaya, alt. 900-1200 m.

ERIGERON (Asteraceae)

E. canadensis L.; see *Conyza canadensis* (L.) Cronq.

E. karvinskianus DC. syn. *E. mucronatus* DC.

A new glycoside isolated from aerial parts and characterised as 3-hydroxy-4-pyrone-3- α -D-glucopyranoside (*Phytochemistry* 1984, 23, 2090).

Distribution : Nilgiri Hills.

E. linifolius Willd.; see *Conyza bonariensis* (L.) Cronq.

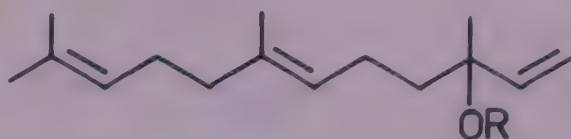
E. mucronatus DC.; see *E. karvinskianus* DC.

ERIOBOTRYA (Rosaceae)

E. japonica (Thunb.) Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 268).

Two new gibberellins - dehydro-GA35 and dehydro-GA25 - isolated from seeds along with GA9, GA15, GA24, GA35 and GA50 (*Chem. Express* 1987, 2, 499; *Chem. Abstr.* 1987, 107, 194952 h; *Agric. Biol. Chem.* 1988, 52, 1353); gibberellins A19, A20, A29, A44 and A61 identified in immature seeds by GC-MS (*Agric. Biol. Chem.* 1988, 52, 1352); a new sesquiterpene glycoside - loquatifolin A - isolated from leaves and characterised as α -L-rhamnopyranosyl(1 \rightarrow 4)- α -L-rhamnopyranosyl(1 \rightarrow 2)-[α -L-rhamnopyranosyl(1 \rightarrow 6)]- β -D-glucopyranosyl-6,7-trans-neloridol (*Chem. Pharm. Bull.* 1988, 36, 1270).

NEW COMPOUNDS



Loquatifolin A

R = Glu[(2→1)Rha(4→1)Rha](6→1)Rha

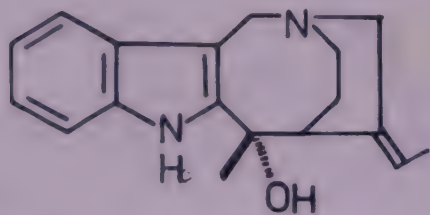
ERIODENDRON (Bombacaceae)*E. anfractuosum* DC.; see *Ceiba pentandra* (L.) Gaertn.**ERIOPHYTON** (Lamiaceae)*E. wallichii* Benth. (*wallichianum*)Succinic acid, β -sitosterol and its glucoside, umbelliferone and marrubiin isolated (*Indian J. Chem.* 1989, 28B, 356).

Distribution : Himalayas, Nepal and Sikkim, alt. 4500-5000 m.

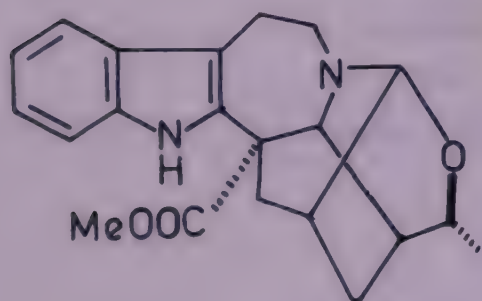
ERUCA (Brassicaceae)*E. sativa* Mill. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 299).Seeds analysed for moisture (4.1), oil (27.8), protein (27.4) and ash (6.6%); calcium and potassium levels found to be 1.18 and 1.11% respectively; determination of linoleic (36.2) and erucic (10.3%) acids in seed oil by GC (*J. Am. Oil Chem. Soc.* 1985, 62, 1134; *Chem. Abstr.* 1985, 103, 85126 p).**ERVATAMIA** (Apocynaceae)*E. coronaria* Stapf; see *Tabernaemontana divaricata* (L.) R.Br. ex R. & S.*E. dichotoma* (Roxb.) Blatter syn. *Tabernaemontana dichotoma* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 268).Fruit extract showed convulsive and spasmolytic activities (*Planta Med.* 1984, 50, 251).A new alkaloid - 16(S)-hydroxy-16,22-dihydroapparicine - isolated from leaves along with voaphylline hydroxyindolenine and its structure established (*J. Nat. Prod.* 1984, 47, 835); (-)apparicine, coronaridine, 3-ketopropylcoronaridine, dichomine, 19R-epiheyneanine, isomethuenine, voaphylline, 12-methoxyvoaphylline, vobasine, vallesamine and O-acetylvallesamine isolated from fruits (*Planta Med.* 1984, 50, 251; *Phytochemistry* 1985, 24, 2097); structure of dimeric alkaloid - monogagine - assigned (*Z. Naturforsch.* 1985, 40B, 693; *Chem.*

Abstr. 1985, 103, 142247 e); isolation and structure determination of a new monomeric alkaloid - 3,19(R)-oxidocoronaridine - and five new dimeric alkaloids - 3'R/S-hydroxy-tabernamine, 3'R/S-hydroxy-N4-demethylervahanine A, 3'R/S-hydroxy-N4-demethylervahanine B, N4-demethyltabernamine and 3'R/S-hydroxy-N4-demethyltabernamine from stems and root bark; 3-oxo-coronaridine, 3-ketopropyl-19(R)-heyneanine, ibogamine, isomethuenine, perivine, tabernamine, voacamine and 3'R/S-hydroxyvoacamine also obtained (*Phytochemistry* 1985, 24, 2097).

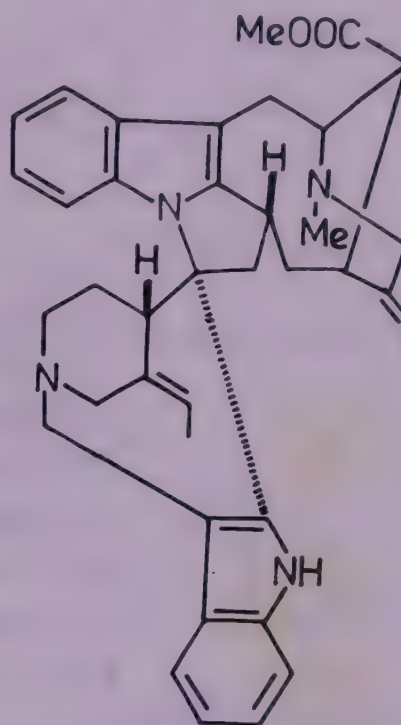
NEW COMPOUNDS



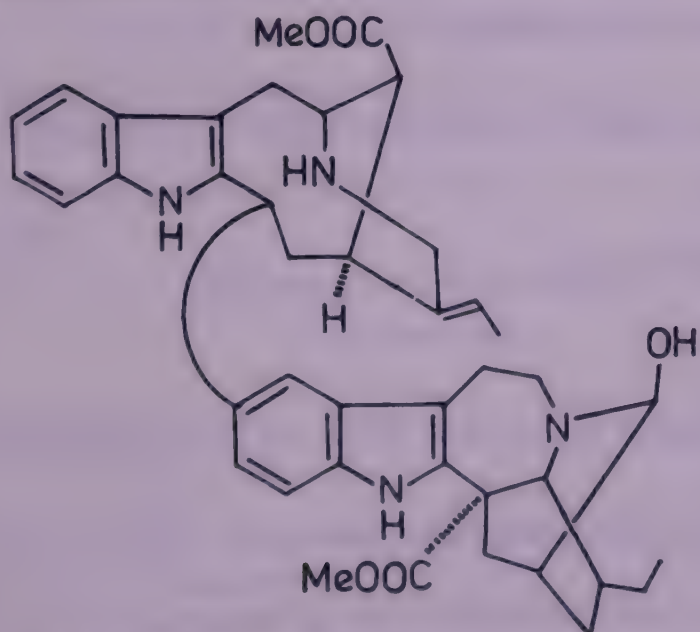
16(S)-Hydroxy-16,22-dihydroapparicine



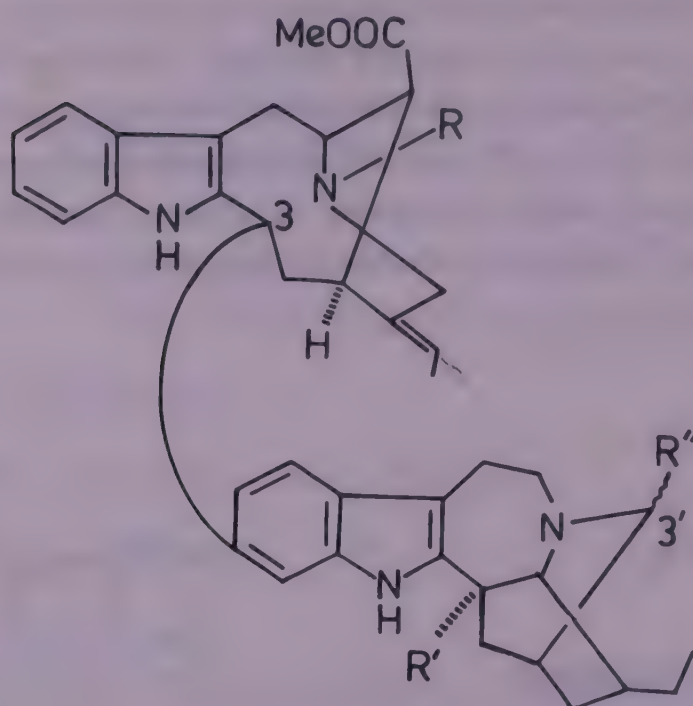
3,19(R)-Oxidocoronaridine



Monogagaine



3'R/S-Hydroxy-N4-demethylervahanine B



3'R/S-Hydroxytabernamine

$R = \text{Me}, R' = \text{H}, R'' = \text{OH}$

3'R/S-Hydroxy-N4-demethylervahanine A

$R = \text{H}, R' = \text{COOMe}, R'' = \text{OH}$

3'R/S-Hydroxy-N4-demethyltabernamine

$R, R' = \text{H}, R'' = \text{OH}$

N4-Demethyltabernamine

$R, R', R'' = \text{H}$

BIOLOGICAL ACTIVITY

Monogagaine showed antimicrobial activity against *Bacillus subtilis* (*Z. Naturforsch.* 1985, 40B, 693; *Chem. Abstr.* 1985, 103, 142247 e).

E. divaricata (L.) Alston; see *Tabernaemontana divaricata* (L.) R.Br. & R.S.

ERVUM (Papilionaceae)

E. lens L.; see *Lens culinaris* Medik.

ERYTHRINA (Papilionaceae)

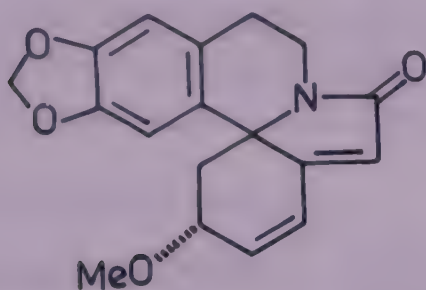
E. arborescens Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 270).

Synthesis of erythraine and crystamidine (*Heterocycles* 1984, 22, 2255).

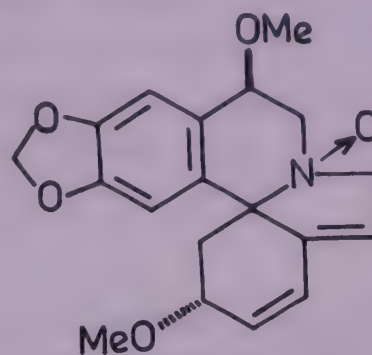
E. crista-galli L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 270).

Erythrabin and crystamidine synthesised (*Heterocycles* 1984, 22, 2255); isolation of 8-oxoerythraline from leaves and its structure determination (*Phytochemistry* 1984, 23, 1336); synthesis of cristadine (*Sci. Komun.* 1986, 11, 8; *Chem. Abstr.* 1988, 108, 6245 d); two new alkaloids - 11 β -methoxyerythraline N-oxide and 11-methoxyerythratine - isolated from flowers and their structures elucidated (*J. Nat. Prod.* 1987, 50, 1146); a new pterocarpan - erycristin - isolated from stem bark along with sandwicensin and erythrabyssin II and its structure and absolute configuration determined (*Phytochemistry* 1988, 27, 381).

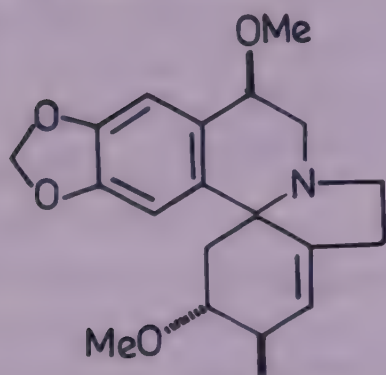
NEW COMPOUNDS



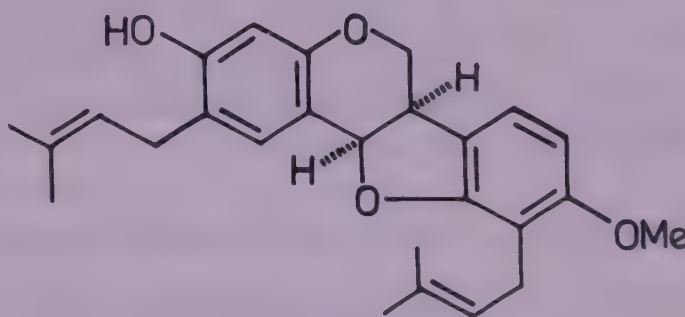
8-Oxoerythraline



11 β -Methoxyerythralin N-oxide



11-Methoxyerythratine

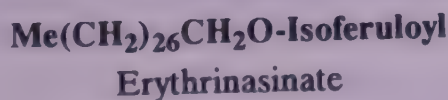


Erycristin

E. fusca Lour. syn. *E. ovalifolia* Roxb., *E. glauca* Willd. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 301).

A new ester - erythrinasinatate - isolated from stem bark along with erythrabyssin I and its structure determined (*Phytochemistry* 1986, 25, 757).

NEW COMPOUNDS



E. glauca Willd.; see *E. fusca* Lour.

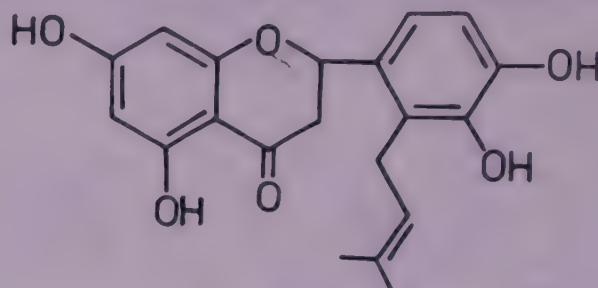
E. indica Lam.; see *E. variegata* L.

E. ovalifolia Roxb.; see *E. fusca* Lour.

E. suberosa Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 271).

β -Sitosterol, campesterol and stigmasterol isolated from seed coat (*Curr. Sci.* 1986, 55, 614); a new prenylated flavanone isolated from roots and characterised as 5,7,3',4'-tetrahydroxy-2'-(3''-methylbut-2''-enyl)flavanone (I) (*Planta Med.* 1987, 53, 221).

NEW COMPOUNDS



I

E. variegata L. syn. *E. variegata* L. var. *orientalis* (L.) Merr., *E. indica* Lam. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 272).

Ferulic and caffeic acids, isorhamnetin-3-O-rhamnoglucoside, rutin, quercetin and its 4-O-glucosyl-3-O-rhamnoglucoside isolated from flowers (*Egypt. J. Pharm. Sci.* 1983, 24, 125; *Chem. Abstr.* 1986, 104, 145492 n); synthesis of erythrinin A (*Tetrahedron* 1985, 41, 2479); erysotine, erythratidine, epierythratidine and 11-hydroxyepierythratidine isolated from bark (*Planta Med.* 1988, 54, 526).

E. variegata L. var. *orientalis* (L.) Merr.; see *E. variegata* L.

ERYTHROXYLUM ((ERYTHROXYLON) (Erythroxylaceae)

E. burmanicum Griff.; see *E. cuneatum* (Miq.) Kurz

E. coca Lam. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 272).

N-Methylpyrrole, N,N-dimethylbenzylamine, methyl salicylate, trans-2-hexenal, cis-3-hexen-1-ol, hexanol and two uncharacterised dihydrobenzaldehydes present in essential oil (*Planta Med.* 1987, 53, 113).

BIOLOGICAL ACTIVITY

Effects of cocaine on two selected parameters of visual function in rabbits determined. Amplitudes of a- and b-waves were reduced and electroretinogram (ERG) pattern was distorted. High correlation was found between changes in a- and b-wave amplitudes and drug dose level (*Indian J. Pharmacol.* 1988, 20, 114).

E. cuneatum (Miq.) Kurz syn. *E. burmanicum* Griff.

A new alkaloid - $3\alpha,6\beta$ -dibenzoyloxytropine - isolated from leaves along with nicotine and its structure determined (*Phytochemistry* 1988, 27, 2181).

Distribution : Andaman Islands and eastern peninsular India.

ESCHSCHOLZIA (Papaveraceae)

E. californica Cham. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 305).

Allocryptopine, bisnorargemonine, californidine, caryachine, chelerythrine, chelilutine, chelirubine, corydine, corytuberine, escholamidine, eschscholtzine, isonorargemonine, isocorydine, macarpine, N-methylaurotetanine, norargemonine, protopine and sanguinarine isolated from aerial parts (*Collect. Czech. Chem. Commun.* 1986, 51, 1743); isolation of eschscholtzine and its N-oxide from petals (*J. Nat. Prod.* 1986, 49, 922).

EUCALYPTUS (Myrtaceae)

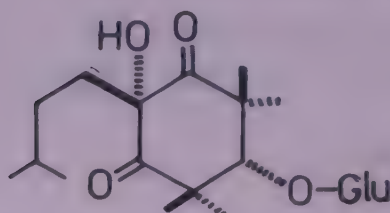
E. camaldulensis Dehnh. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 274).

Oleanolic and maslinic acids identified in leaves (*Khim. Prir. Soedin.* 1985, 271; *Chem. Abstr.* 1985, 102, 51198 y); borneol, camphene, cineole, citronellal, citronellyl acetate, p-cymene, limonene, linalool, phellandrene, α - and β -pinenes, piperitone, γ -terpinene, terpin-1-en-4-ol and α -terpineol isolated from essential oil (*Indian For.* 1985, 111, 1077; *Chem. Abstr.* 1986, 105, 130704 e); presence of cineole (39.7), 4-terpinenyl acetate (13.2), citronellal (7.9), 1,3,3-trimethyl-2-(3-methyl-2-methylene-3-butenylidene)cyclohexanol (7.8), thujene (6.7), car-4-ene (5.4) and alloocimene (2.5%) as major constituents in essential oil from leaves by GC-MS (*Bangladesh J. Sci. Ind. Res.* 1987, 22, 152; *Chem. Abstr.* 1989, 110, 111760 g).

E. citriodora Hook. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 274).

Different chemo-variants of Kenyan plant yielded essential oil from leaves (2.2-8.3%) containing citronellal (65.0-88.0), citronellol (2.0-25.0) and isopulegol (2.0-19.0%) (*East Afr. Agric. For. J.* 1980, 46, 89; *Chem. Abstr.* 1986, 104, 39493 d); eucalyptin, p-menthane-cis/trans-3,8-diols and ferulic acid isolated from leaves (*Linchan Huaxue Yu Gongye* 1986, 6, 28; *Chem. Abstr.* 1987, 106, 15783 p); quercetin and its 3-O-glucoside, myricetin, its 3-glucoside and 3-rhamnoside isolated from leaves (*Linchan Huaxue Yu Gongye* 1987, 7, 28; *Chem. Abstr.* 1988, 108, 147172 q); citriodorin isolated from leaves and its structure elucidated (*Linchan Huaxue Yu Gongye* 1987, 7, 35; *Chem. Abstr.* 1988, 108, 183614 u).

NEW COMPOUNDS



Citriodorin

E. deglupta Blume

Eng. & H. - Eucalyptus.

Borneol, camphene, cineole, citronellal, citronellyl acetate, p-cymene, limonene, linalool, phellandrene, α - and β -pinenes, piperitone, γ -terpinene, terpin-1-en-4-ol and α -terpineol isolated from essential oil (*Indian For.* 1985, 111, 1077; *Chem. Abstr.* 1986, 105, 130704 e).

Distribution : Introduced into Indian gardens.

E. exserta F. Muell. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 275).

1,8-Cineole (44.8) and α -pinene (37.14%) identified in leaf oil by GC-MS (*Indian Perfum.* 1988, 32, 18; *Chem. Abstr.* 1989, 111, 63728 z).

E. globulus Labill. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 275).

1,8-Cineole identified in fruit essential oil (*Herba Hung.* 1984, 23, 21; *Chem. Abstr.* 1985, 103, 146960 e); oleanolic and maslinic acids isolated from leaves (*Khim. Pri. Soedin.* 1985, 271; *Chem. Abstr.* 1985, 102, 51198 y); 4-hydroxytritriacontan-16,18-dione and 16-hydroxy-18-tritriacontanone isolated from leaf wax (*J. Agric. Food Chem.* 1985, 33, 777; *Chem. Abstr.* 1985, 103, 157288 t).

BIOLOGICAL ACTIVITY

4-Hydroxytritriacontan-16,18-dione showed strong antioxidant activity in a water alcohol system (*J. Agric. Food Chem.* 1985, 33, 777; *Chem. Abstr.* 1985, 103, 157288 t).

E. leucoxylon F. Muell.

Oleanolic and maslinic acids isolated from leaves (*Khim. Pri. Soedin.* 1985, 271; *Chem. Abstr.* 1985, 102, 51198 y).

Distribution : Introduced in Nilgiris.

E. maideni F. Muell.

Eng. & H. - Eucalyptus.

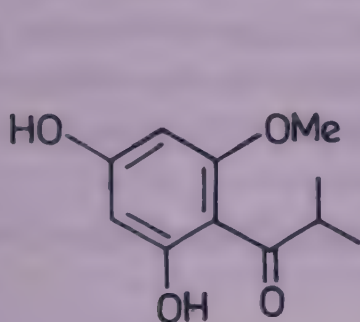
1,8-Cineole (70.0) and α -pinene (5.39%) found in essential oil of Portuguese plant (*Essent. Oils Aromat. Plants, Proc. Int. Symp.* 1984, 163; *Chem. Abstr.* 1986, 104, 10347 y).

Distribution : Introduced into India in Nilgiris and Shimla.

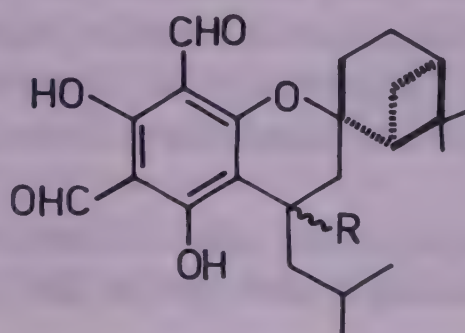
E. multiflora Poir. syn. *E. robusta* Smith (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 277).

Borneol, camphene, cineole, citronellal, citronellyl acetate, p-cymene, limonene, linalool, phellandrene, α - and β -pinenes, piperitone, γ -terpinene, terpin-1-en-4-ol and α -terpineol isolated from essential oil (*Indian For.* 1985, 111, 1077; *Chem. Abstr.* 1986, 105, 130704 e); a new acylphloroglucinol - robustaol B - isolated from leaves, its structure determined and confirmed by synthesis; 7,4'-dimethoxy-6,8-dimethyl-5-hydroxyflavone, 5,4'-dihydroxy-7-methoxy-6,8-dimethylflavone, 3 β -hydroxyurs-11-en-28-oic-13(28)-lactone, 3 β -acetoxyurs-11-en-28-oic-13(28)-lactone, uvaol, 5,7-dihydroxy-2-methylchromone-7-O-glucoside, 1-triacontanol, 1-triacontanoic acid and β -sitosterol also isolated (*Huaxue Xuebao* 1986, 44, 151; *Chem. Abstr.* 1986, 104, 203867 b); structures of robustadials A and B revised (*J. Org. Chem.* 1988, 53, 4562); revised structures confirmed by stereoselective synthesis (*J. Am. Chem. Soc.* 1988, 110, 5213; *J. Org. Chem.* 1989, 54, 1562).

NEW COMPOUNDS



Robustaol B



Robustadial A

R = α -H

Robustadial B

R = β -H

E. obliqua L'Herit.

Oleanolic and maslinic acids isolated from leaves (*Khim. Priir. Soedin.* 1985, 271; *Chem. Abstr.* 1985, 102, 51198 y).

Distribution : Introduced in Nilgiris.

E. ovata Labill

Oleanolic and maslinic acids isolated from leaves (*Khim. Priir. Soedin.* 1985, 271; *Chem. Abstr.* 1985, 102, 51198 y).

Distribution : Introduced into India.

E. pulverulenta Sims. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 278).

1,8-Cineole (82.5%) along with δ -terpineol and cis- and trans-1(7),8-menthadien-2-ol identified in leaf oil (*Planta Med.* 1985, 51, 170).

E. robusta Smith; see *E. multiflora* Poir.

E. smithii R.T. Baker

Eng. & H. - Eucalyptus.

1,8-Cineole (>70.0) and α -pinene (5.39%) identified in essential oil of South African plant (*Essent. Oils Aromat. Plants, Proc. Int Symp.* 1984, 163; *Chem. Abstr.* 1986, 104, 10347 y).
Distribution : Introduced into plains of India.

E. tereticornis Sm.; see *E. umbellatum* Domin

E. umbellatum Domin (*umbellata*) syn. *E. tereticornis* Sm.

Eng. & H. - Eucalyptus.

Oleanolic and maslinic acids isolated from leaves (*Khim. Prir. Soedin.* 1985, 271; *Chem. Abstr.* 1985, 102, 51198 y); borneol, camphene, cineole, citronellal, citronellyl acetate, p-cymene, limonene, linalool, phellandrene, α - and β -pinenes, piperitone, γ -terpinene, terpin-1-en-4-ol and α -terpineol isolated from essential oil (*Indian For.* 1985, 111, 1077; *Chem. Abstr.* 1986, 105, 130704 e).

Distribution : Introduced into India in Nilgiris, Maharashtra, Uttar Pradesh, Punjab and Himachal Pradesh, upto alt. 1200 m.

EUGENIA (Myrtaceae)

E. alternifolia Wight; see *Syzygium alternifolium* (Wight) Walp.

E. caryophyllata Thunb.; see *Syzygium aromaticum* (L.) Merr. & Perry

E. caryophyllus (Spreng.) Bullock & Harrison; see *Syzygium aromaticum* (L.) Merr. & Perry

E. jambolana Lam.; see *Syzygium cumini* (L.) Skeels

E. javanica Lamk.; see *Syzygium samarangense* (Bl.) Merr. & Perry

E. micheli Lamk.; see *E. uniflora* L.

E. uniflora L. syn. *E. micheli* Lamk.

Eng - Surinam cherry; Bo. - Pitanga.

Selina-1,3,7(11)-trien-8-one and oxidoselina-1,3,7(11)-trien-8-one identified in leaf essential oil by GC-MS (*Planta Med.* 1988, 54, 546).

Distribution : Native of South America, grown in Indian gardens.

EULOPHIA (Orchidaceae)

E. nuda Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 279).

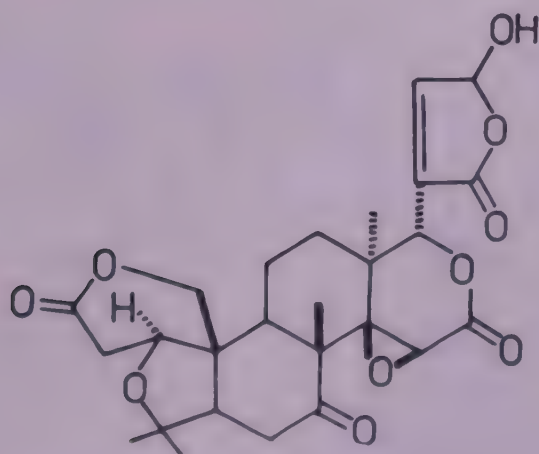
Isolation of nudol (*Phytochemistry* 1985, 24, 801); 9,10-dihydro-2,5-dimethoxyphenanthrene-1,7-diol isolated from tubers and its crystal structure determined; 9,10-dihydro-4-methoxyphenanthrene-2,7-diol, 1,5-dimethoxyphenanthrene-2,7-diol, 5,7-dimethoxyphenanthrene-2,6-diol, 1,5,7-trimethoxyphenanthrene-2,6-diol, 4,8,4',8'-tetramethoxy[1,1'-biphenanthrene]-2,7,2',7'-tetraol, 4-hydroxybenzaldehyde and 4-hydroxybenzyl alcohol also isolated from tubers (*Phytochemistry* 1988, 27, 3267).

EUODIA (EVODIA) (Rutaceae)

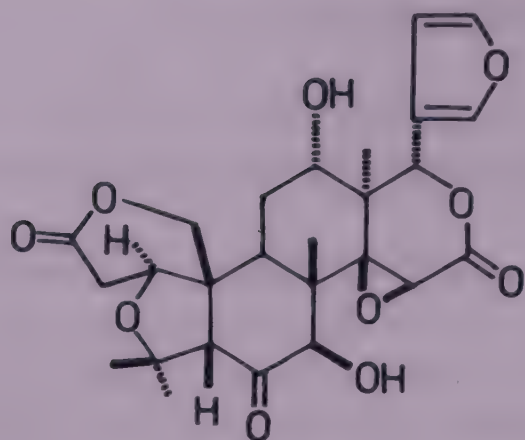
E. glabrifolia (Champ. ex Benth.) Balak. syn. *E. miliaefolia* (Hance.) Benth., *E. glauca* Miq., *Tetradium glabrifolium* (Champ. ex Benth.) T.G. Hartley (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 279).

Isolation and structure elucidation of a limonoid - rutaevinexic acid - from root and stem bark; isolimonexic acid, limonin, arnottianamide, 1-hydroxyrutaecarpine, decarine and γ -fagarine also isolated (*J. Nat. Prod.* 1987, 50, 1160); glaucin A (glaucin A) isolated from root bark along with limonin, limonin diosphenol and rutaevin and its structure elucidated (*Bull. Chem. Soc. Jpn.* 1987, 60, 2503; *Phytochemistry* 1988, 27, 1429); isolation and structure determination of glaucin B from root bark (*Phytochemistry* 1988, 27, 1429).

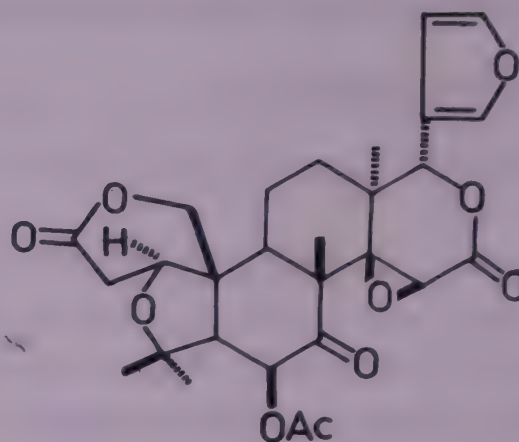
NEW COMPOUNDS



Rutaevinexic acid



Glaucin A



Glaucin B

BIOLOGICAL ACTIVITY

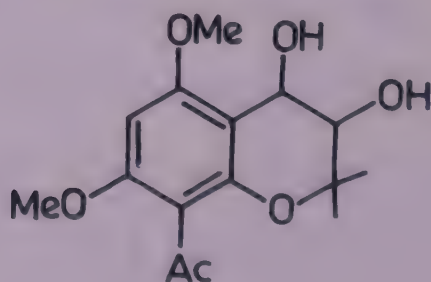
Limonin and limonin diosphenol showed antifeedant activity against *Spodoptera litura* larvae; rutaevin at 100.0 $\mu\text{g/ml}$ showed antimicrobial activity (*Bull. Chem. Soc. Jpn.* 1987, 60, 2503; *Phytochemistry* 1988, 27, 1429).

E. glauca Miq.; see *E. glabrifolia* (Champ. ex Benth.) Balak.

E. lunu-ankenda (Gaertn.) Merr. syn. *E. roxburghiana* Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 115).

Isolation and characterisation of 8-acetyl-3,4-dihydroxy-5,7-dimethoxy-2,2-dimethylchroman (I) from aerial parts along with alloeovodionol-7-methyl ether, 4-methoxy-1-methyl-2(1H)quinolinone, evolitrine and isoevodionol and its methyl ether (*Phytochemistry* 1985, 24, 199); dictamnine, evolitrine, kokusaginine, N-methyl-4-methoxy-2-quinoline and marmesin isolated from bark (*J. Nat. Prod.* 1985, 48, 501).

NEW COMPOUNDS



I

BIOLOGICAL ACTIVITY

8-Acetyl-3,4-dihydroxy-5,7-dimethoxy-2,2-dimethylchroman, alloeovodionol-7-methyl ether, 4-methoxy-1-methyl-2(1H)quinolinone and evolitrine showed bacteriostatic activity against *Bacillus subtilis* and *Staphylococcus aureus* at minimum inhibitory concentrations of 250.0, 250.0, 250.0 and 62.5 $\mu\text{g/ml}$ respectively (*Phytochemistry* 1985, 24, 199).

E. miliaefolia (Hance.) Benth.; see *E. glabrifolia* (Champ. ex Benth.) Balak.

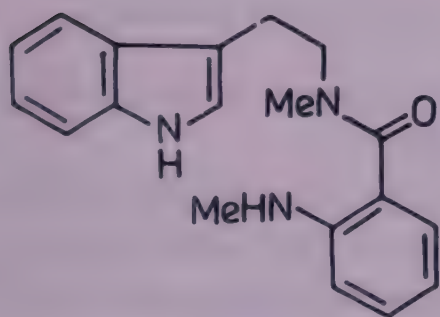
E. roxburghiana Benth.; see *E. luna-ankenda* (Gaertn.) Merr.

E. ruticarpa (*rutaecarpa*) (Juss.) Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 279).

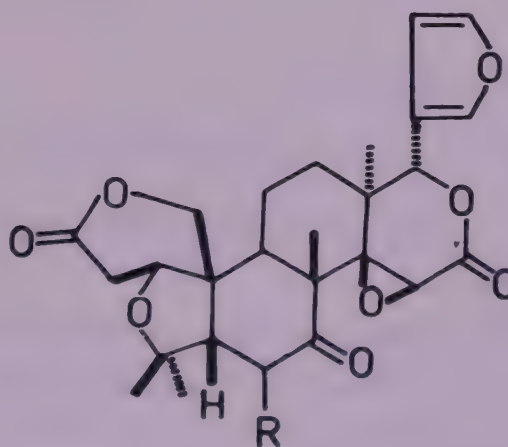
Fruit extract exhibited positive inotropic effect on guinea pig isolated left atria (*J. Pharm. Sci.* 1986, 75, 612).

Evodiamine isolated from fruits (*J. Pharm. Sci.* 1986, 75, 612); an amide isolated and characterised as N-(2-methylaminobenzoyl)-tryptamine (*J. Nat. Prod.* 1988, 51, 161); evodiamide isolated and its structure confirmed by synthesis (*J. Nat. Prod.* 1988, 51, 791); two new limonoids - 6 α - and 6 β -acetoxy-5-epilimonins - isolated from fruits along with limonin and evodol and their structures elucidated (*Chem. Pharm. Bull.* 1988, 36, 1237, 4453); isolation and structure determination of new limonoids - 12 α -hydroxylimonin and 12 α -hydroxyevodol - and quinolone alkaloids - 1-methyl-2-[(Z)6-undecenyl]-4(1H)-quinolone, 1-methyl-2-[(Z)10-pentadecenyl]-4(1H)-quinolone, 1-methyl-2-[(Z)6-pentadecenyl]-4(1H)-quinolone, 1-methyl-2-[(6Z,9Z)6,9-pentadecadienyl]-4(1H)-quinolone and 1-methyl-2-[(4Z,7Z)4,7-tridecadienyl]-4(1H)-quinolone - from fruits; evodol, limonin, rutaevin and its acetate, obacune, jangomolide, glaucin A, evocarpine, dihydroevocarpine, 1-methyl-2-undecyl-4(1H)-quinolone and 1-methyl-2-pentadecyl-4(1H)-quinolone also isolated (*Chem. Pharm. Bull.* 1988, 36, 4453).

NEW COMPOUNDS



Evodiamide



6 α -Acetoxy-5-epilimonin

R = α -OAc

6 β -Acetoxy-5-epilimonin

R = β -OAc

BIOLOGICAL ACTIVITY

Evocarpine inhibited contraction induced by K⁺ and Ca²⁺ in depolarised muscles of isolated rat thoracic aorta (*Eur. J. Pharmacol.* 1988, 155, 139); *in vivo* and *in vitro* studies with

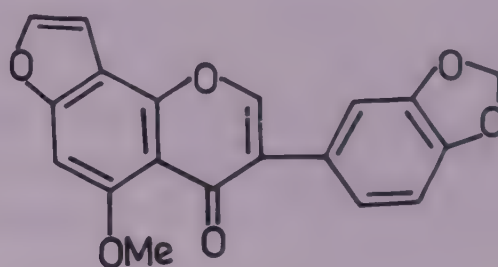
dehydroevodiamine (5.0, 10.0 and 20.0 mg/kg, i.p.) showed hypotensive and bradycardiac effects that lasted for at least 2 hr; it (0.01-1.0 μ M) shifted concentration-response curve of histamine to the right without any effect on maximal contractile tension in isolated rat thoracic aorta preparation; norepinephrine-induced maximal contractile tension was also unaffected. Dehydroevodiamine elicited hypotensive as well as negative chronotropic effects (*Asia Pac. J. Pharmacol.* 1988, 3, 191; *Chem. Abstr.* 1989, 110, 165816 y).

EUONYMUS (Celastraceae)

E. pendulus Wall. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 308).

A new isoflavone - garhwalin - isolated from stem bark along with isohexacosane, cetyl alcohol, cerotic acid, n-octacosanol, β -sitosterol and uvaol and its structure determined (*Pharmazie* 1987, 42, 558; *Chem. Abstr.* 1988, 108, 91665 h).

NEW COMPOUNDS



Garhwalin

EUPATORIUM (Asteraceae)

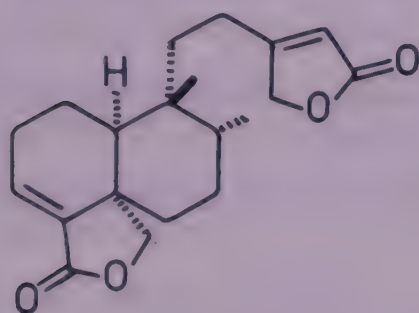
E. adenophorum Spreng.; see *Ageratina adenophora* (Spreng.) King & Robinson

E. cannabinum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 280).

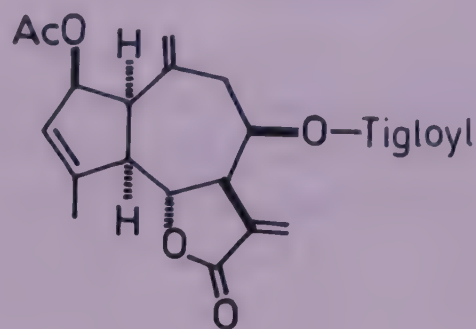
Detection of α - and β -pinenes, camphene, thymyl methyl ether, hexyl acetate, heptyl acetate, n-nonanal, n-octanal and decanal in essential oil by GC-MS (*Planta Med.* 1985, 51, 541); stigmasterol, β -sitosterol, campesterol and taraxasterol isolated from dried leaves (*Boll. Soc. Ital. Biol. Sper.* 1985, 61, 1087; *Chem. Abstr.* 1985, 103, 211173 s); euparin and eupafornin isolated from plant collected near Sevojno, Serbia, whereas plant collected from other regions of Europe afforded eupatoriopicrin, eupatolide and astragalin (*J. Serb. Chem. Soc.* 1986, 51, 575; *Chem. Abstr.* 1987, 107, 233055 q); supinine, petasinine, doronenine and bulgarsenine identified by GC-MS (*Mitt. Geb. Lebensmittelunters. Hyg.* 1987, 78, 208; *Chem. Abstr.* 1988, 108, 3405 v); isolation and structure determination of three new lactones - eupatoriopicrin-19-O-linolenate, 8 β -acetoxy-2 α -hydroxycostunolide and 2-acetyl-8 β -[4,5-dihydroxytigloyloxy]preeupatundin (I) - and a new clerodane derivative - cannaclerodanolide -

from roots and aerial parts; eupatolide (hydrolytic product of eupatoriopicrin), eupatoriopicrin, eucannabinolide and 10-acetoxyneryl acetate also isolated (*Planta Med.* 1987, 53, 169); seven benzofuran derivatives (II-VIII) isolated from root culture and characterised (*Phytochemistry* 1989, 28, 789); kaempferol-3-O-rutinoside, quercetin-3-O-glucoside and -3-O-rutinoside isolated (*Fitoterapia* 1988, 59, 236).

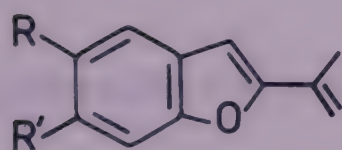
NEW COMPOUNDS



Cannaclerodanolide



I

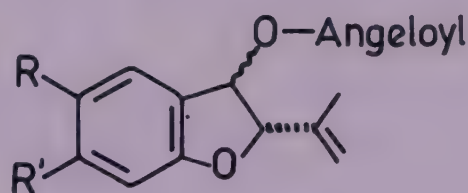


II

R = Ac, R' = OH

III

R = OH, R' = Ac



IV

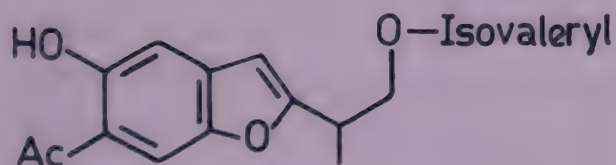
R = Ac, R' = OH, ~ = α

V

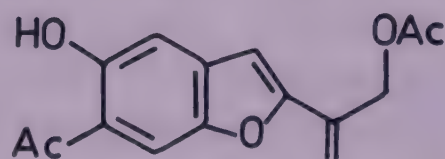
R = Ac, R' = OH, ~ = β

VI

R = OH, R' = Ac, ~ = β



VII



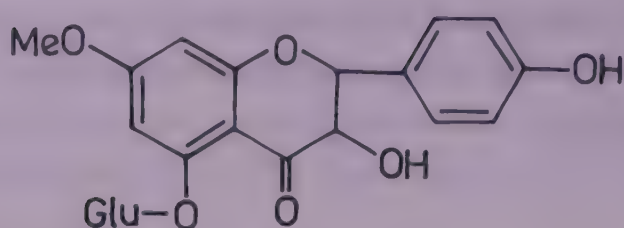
VIII

E. erythropappum Robinson

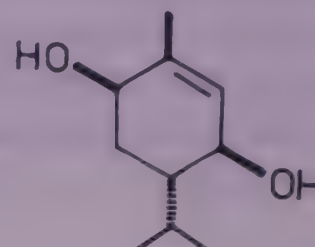
Isolation and structure elucidation of a new flavanone glucoside - eupathronoside - and a new monoterpenediol - (-)-1S,2R,4S,5R- 2,5-dihydroxy-p-menthane (I) - from whole plant; kaempferol-5-methyl ether, (+)-3S,4S,6R-3,6-dihydroxy-p-menth-1-ene, physcion, coumarin, methyl p-coumarate and β -sitosterol also isolated (*J. Indian Chem. Soc.* 1985, 62, 999).

Distribution : West Bengal.

NEW COMPOUNDS



Eupathronoside



I

E. odoratum L. syn. *Chromolaena odorata* (L.) King & Robinson (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 280).

Essential oil showed antibacterial activity against *Staphylococcus aureus* and *Escherichia coli* (*Int. J. Crude Drug Res.* 1987, 25, 49).

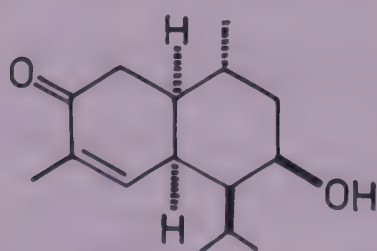
Determination of α -pinene (19.32), cadinene (19.09), (+)camphor (15.46), limonene (10.22), β -caryophyllene (7.05), cadinol (6.36%), citronellal, p-cymene and geraniol in leaf essential oil (*Int. J. Crude Drug Res.* 1987, 25, 49).

E. trapezoideum Kunth

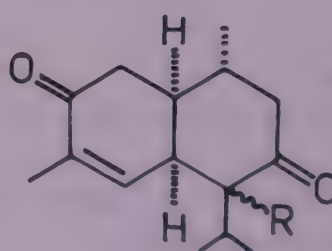
Five new cadinenes (I-V) isolated and their absolute stereochemistry determined by X-ray studies (*Tetrahedron* 1986, 42, 1157).

Distribution : Meghalaya.

NEW COMPOUNDS



I

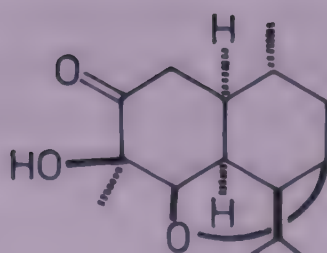


II

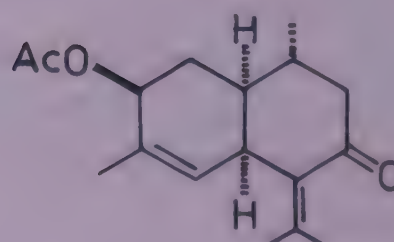
R = α -H

III

R = β -H



IV



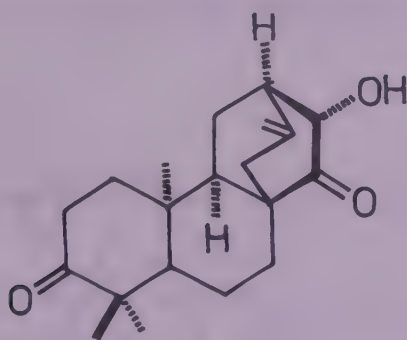
V

EUPHORBIA (Euphorbiaceae)

E. acaulis Roxb.; see *E. fusiformis* Buch.-Ham. ex D. Don

E. antiquorum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 281).

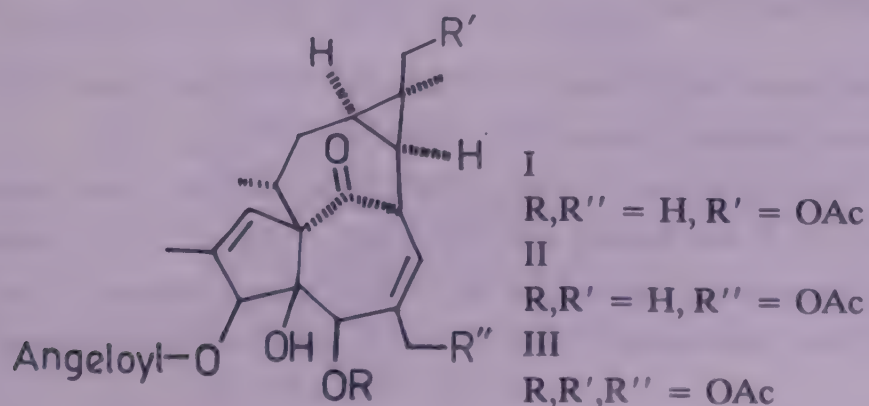
A new diterpene - antiquorin - isolated along with friedelan-3 β -ol and taraxerol and its structure determined (*Phytochemistry* 1989, 28, 553); isolation of new triterpenoids - friedelan-3 β ,30-diol diacetate, 30-acetoxymfriedelan-3 β -ol and 3 β -acetoxymfriedelan-30-ol - from stem; taraxeryl acetate, friedelan-3 β -yl acetate, lupeol and its cinnamate, moretenone, taraxerone, β -amyrin, cycloartenol, euphol, taraxerol, cycloartan-3 β ,25-diol, C-24 epimers of cycloart-25-en-3 β ,24-diol and β -sitosterol also isolated (*Phytochemistry* 1989, 28, 1695).

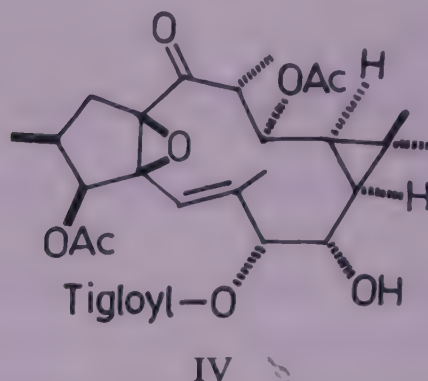
NEW COMPOUNDS

Antiquorin

E. barnhartii Croizat syn. *E. trigona* sensu Hook.f. (non Haw.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 281).

Euphol, cycloartenol, cycloartanol, α - and β -amyrins isolated from latex (*Indian J. Pharm. Sci.* 1985, 47, 194); cycloart-25-en-3 β ,24-diol isolated from stems and shown to be a 1:1 mixture of C-24 epimers by ¹³C-NMR spectroscopy (*Phytochemistry* 1985, 24, 1610); three ingenol esters - 17-O-acetyl-3-O-[(Z)2-methyl-2-butenoyl]-20-deoxy-17-hydroxyingenol (I), 20-O-acetyl-3-O[(Z)2-methyl-2-butenoyl]ingenol (II) and 5,17,20-O-triacetyl-3-O-[(Z)2-methyl-2-butenoyl]-17-hydroxyingenol (III) - and an ingol ester - 3,12-O-diacetyl-7-O-[(E)2-methyl-2-butenoyl]-8,13-diepi-ingol (IV), - isolated from Japanese plant (*Agric. Biol. Chem.* 1989, 53, 425).

NEW COMPOUNDS



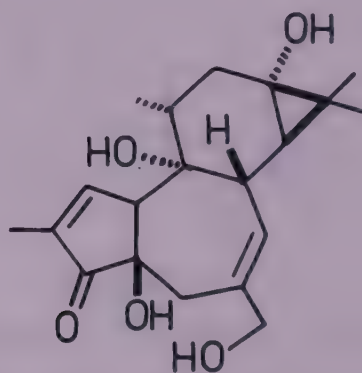
BIOLOGICAL ACTIVITY

Ingenol esters I, II and III showed piscicidal activity (*Agric. Biol. Chem.* 1989, 53, 425).

E. cornigera Boiss. syn. *E. pilosa* L. var. *cornigera* (Boiss.) Hook.f. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 310).

Prostratin isolated from dried roots and characterized (*Planta Med.* 1985, 51, 353).

NEW COMPOUNDS



Prostratin

BIOLOGICAL ACTIVITY

The irritant dose (ID₅₀) of prostratin using erythema assay in mice was 0.95 μ g (*Planta Med.* 1985, 51, 353).

E. dracunculoides Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 281).

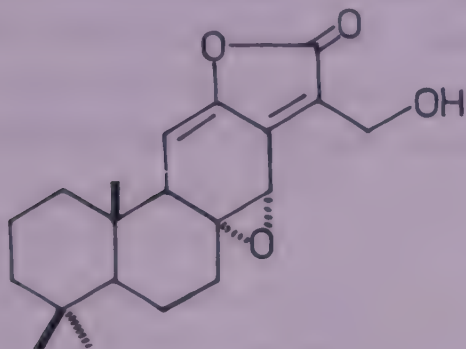
Quercetin-3-O- β -D-glucopyranosyl(1 \rightarrow 4)-O- α -L-rhamnoside isolated from leaves and characterised (*Natl. Acad. Sci. Lett.* 1987, 10, 95).

E. fusiformis Buch.-Ham. ex D.Don syn. *E. acaulis* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 113).

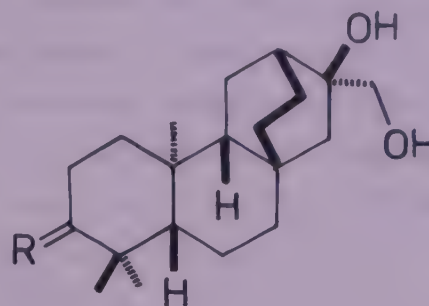
A new diterpene lactone - caudicifolin - isolated from rhizomes and its structure determined by X-ray studies (*Phytochemistry* 1986, 25, 1411); isolation and crystal structure determination of 3-oxoatisan-16 α ,17-diol from rhizomes (*J. Nat. Prod.* 1987, 50, 790); a new diterpene - ent-atisan-3 β ,16 α ,17-triol (I) - isolated from rhizomes and its structure elucidated

(*Phytochemistry* 1988, 27, 1530); a new ellagic acid glycoside - 3,3'-di-O-methylellagic acid-4'-rutinoside - isolated along with 3,4,3'-tri-O-methylellagic acid from rhizomes (*Phytochemistry* 1988, 27, 2313).

NEW COMPOUNDS



Caudicifolin



I

R = α -OH, H

3-Oxoatisan-16 α ,17-diol

R = O

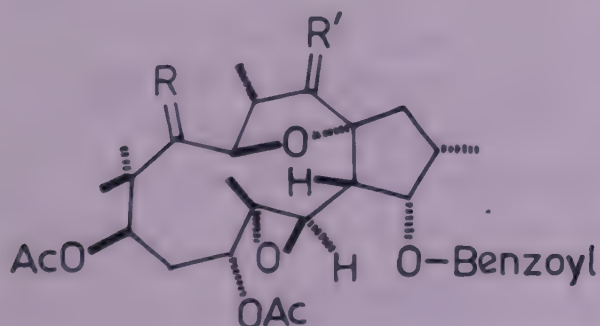
E. granulata Forsk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 281).

Hentriacontane, dotriacontanol, lupeol and its acetate, taraxasterol and its acetate, sitosterol and gallic acid isolated from whole plant (*Fitoterapia* 1986, 57, 280).

E. helioscopia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 281).

Five new diterpenes - euphohelins A, B, C, D, E - isolated and their stereostructures determined (*Bull. Chem. Soc. Jpn.* 1985, 58, 3112).

NEW COMPOUNDS



Euphohelin A

R = α -OH, H, R' = α -OAc, H

Euphohelin B

R, R' = α -OH, H

Euphohelin C

R = α -O-Benzoyl, H, R' = α -OAc, H

Euphohelin D

R, R' = O

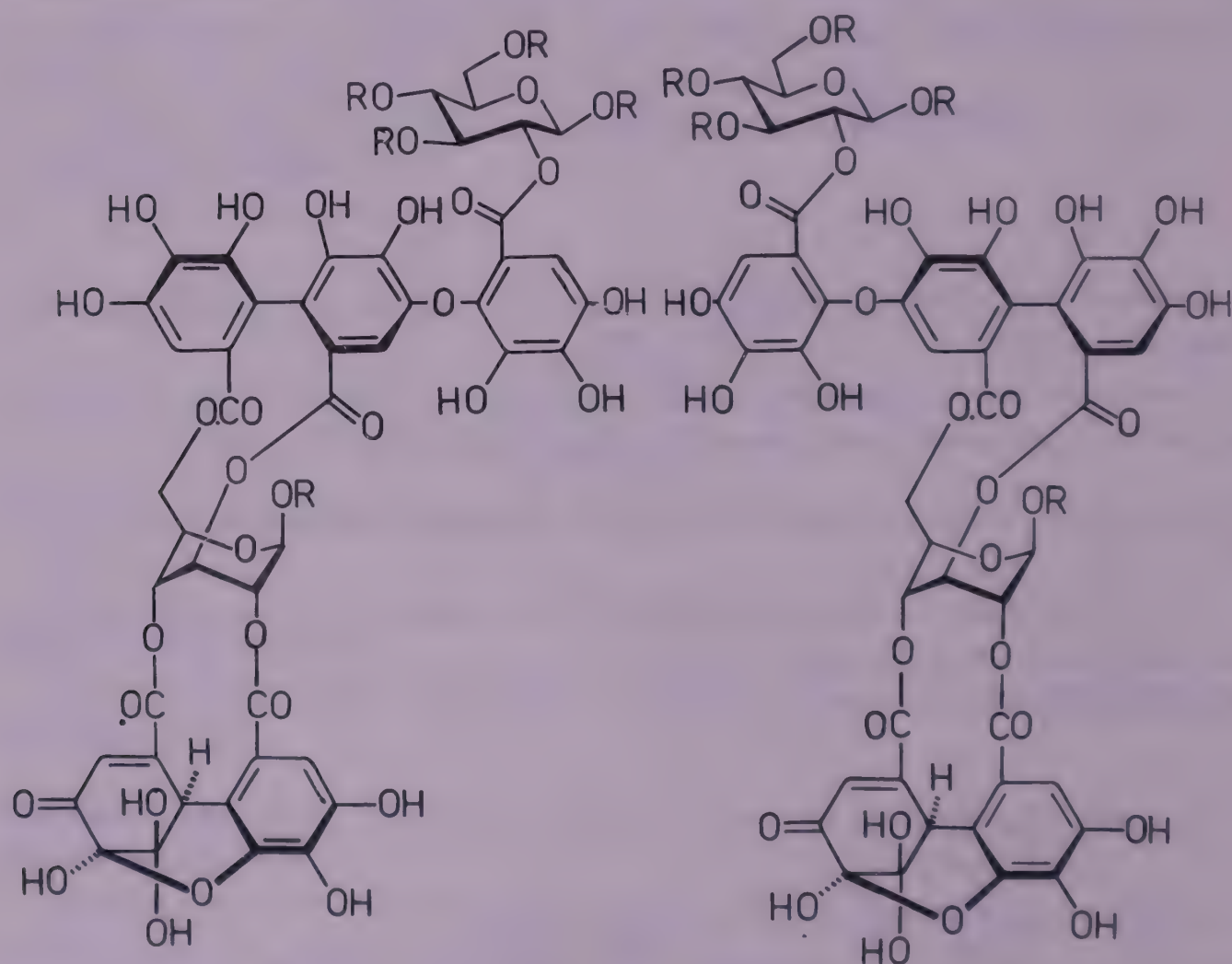
Euphohelin E

R = α -OH, H, R' = O

E. hirta L. syn. *E. pilulifera* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 283).

Two new dehydroellagitannins - euphorbins A and B - isolated from aerial parts and their structures elucidated; 2,4,6-tri-O-galloyl- β -D-glucose, 1,3,4,6-tetra-O-galloyl- β -D-glucose, 1,2,3,4,6-penta-O-galloyl- β -D-glucose, geraniin, terchebin, 3-O-caffeoylquinic acid and 3,4-di-O-galloylquinic acid also isolated (*Chem. Pharm. Bull.* 1988, 36, 2940); quercetin, kaempferol, afzelin, myricetin, quercitrin, myricitrin, quercetin-7-glucoside, myo-inositol, gallic acid and protocatechuic acid isolated (*Chùng-hua Yao Hsueh Tsa Chih* 1988, 40, 49; *Chem. Abstr.* 1989, 110, 82348 w).

NEW COMPOUNDS



Euphorbin A
R = Galloyl

Euphorbin B
R = Galloyl

E. lactea Haw.

24-Methylenecycloartenol, euphorbol hexacosanoate, tinyatoxin and 12-deoxyphorbol-13,20-diacetate isolated from roots (*Herba Hung.* 1986, 25, 49; *Chem. Abstr.* 1987, 107, 151204 y).

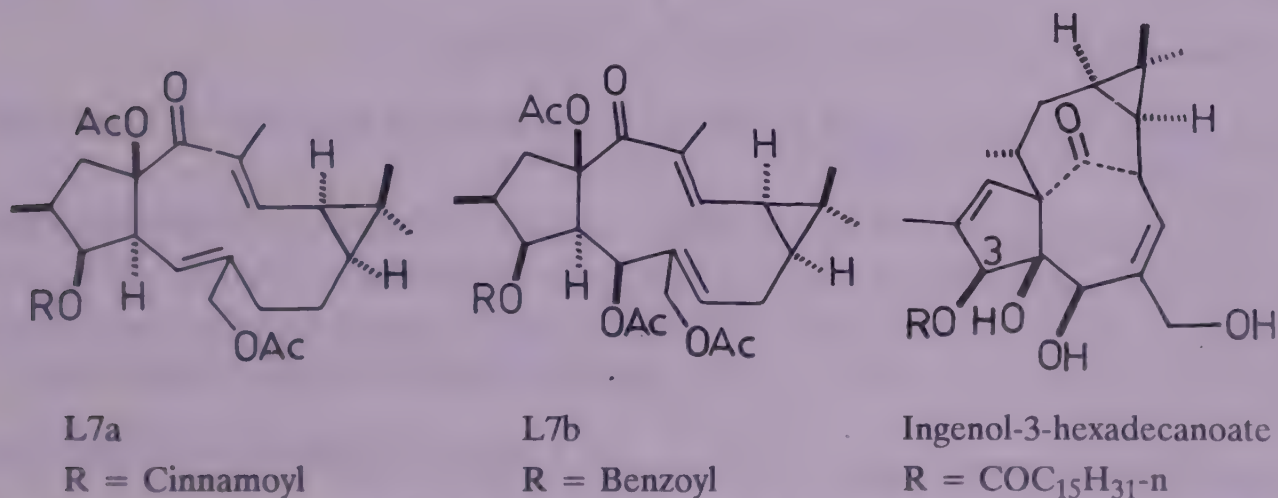
Distribution : Native of Moluccas, introduced in Indian Botanic Garden, Calcutta.

E. lathyrus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 283).

Seed extract showed antitumor activity against sarcoma 180 ascites in mice (*Planta Med.* 1989, 55, 271).

Ester L7, previously isolated from seeds (*Z. Krebsforsch.* 1975, 84, 325), resolved into L7a and L7b characterised as 15,17-di-O-acetyl-3-O-cinnamoyl-17-hydroxyjolkinol and 5,15,17-tri-O-acetyl-3-O-benzoyl-17-hydroxyisolathyril respectively (*Phytochemistry* 1984, 23, 1461); seed oil (48.0- 50.0%) contained oleic acid (8.3%) (*Landbauforsch. Voelkenrode* 1987, 37, 207; *Chem. Abstr.* 1988, 109, 35251 d); taraxerol, taraxerone, ψ -taraxasterol, simiarenol, simiarenone, β -amyrin, β -amyrenone, lupeol, lupenone, isomotone, isomotirol, α -fernenol, α - and β -fernenones and filicanone isolated from leaf surface wax; β -amyrin and lupeol found to be esterified with homologous series of fatty acids (*Z. Naturforsch.* 1989, 44C, 193; *Chem. Abstr.* 1989, 111, 112306 w); isolation and structure determination of antitumor compound - ingenol-3-hexadecanoate - from seeds along with inactive diterpene - ingenol-20-hexadecanoate (*Planta Med.* 1989, 55, 271).

NEW COMPOUNDS



E. millii Ch.des Moulins syn. *E. splendens* Bojer ex Hook. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 284).

12-Deoxy-4 β -hydroxyphorbol-13-dodecanoate-20-acetate and 12-deoxyphorbol-13,20-diacetate isolated from latex (*Herba Hung.* 1984, 23, 67; *Chem. Abstr.* 1985, 102, 218334 h).

E. nivulia Buch.-Ham. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 114).

A new triterpene - cycloart-25-en-3 β -ol - isolated along with cyclolaudenol and its structure determined (*Phytochemistry* 1986, 25, 277).

E. peplus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 285).

A new ester - ingenol-20-octanoate - isolated along with 20-deoxyingenol-3-O-angelate and characterised (*Phytochemistry* 1985, 24, 1605).

BIOLOGICAL ACTIVITY

Irritant doses (ID₅₀) of 20-deoxyingenol-3-O-angelate and ingenol-20-O-octanoate on mouse skin were 0.18 µg and 1.0 µg respectively (*Phytochemistry* 1985, 24, 1605).

E. pilosa L. var. *cornigera* (Boiss.) Hook.f.; see *E. cornigera* Boiss.

E. pilulifera L.; see *E. hirta* L.

E. royleana Boiss. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 286).

Resin from latex caused pronounced inflammation of mammalian skin (*Phytochemistry* 1984, 23, 2377).

α-Amyrin, octacosanol, hexacosanol, tetracosanol, docosanol, β-sitosterol, stigmasterol and campesterol isolated from latex (*Fitoterapia* 1984, 55, 245).

E. splendens Bojer ex Hook.; see *E. millii* Ch. des Moulins

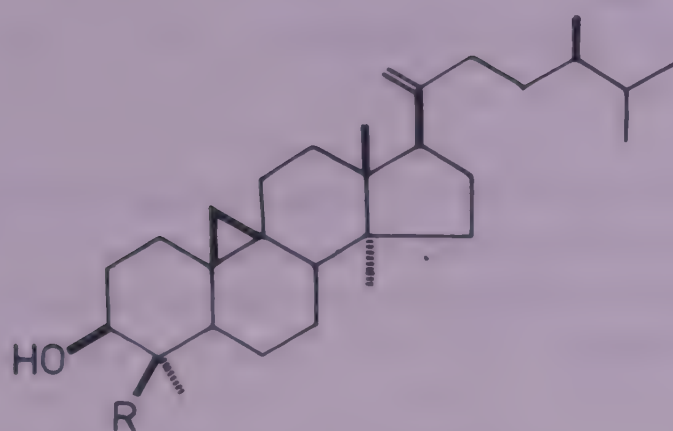
E. thymifolia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 286).

Ethyl acetate extract (0.45 mg/ml) and chloroform extract (0.75 mg/ml) inhibited growth of *Escherichia coli* and *Shigella flexneri* *in vitro*. Ethyl acetate extract was also active against *S. flexneri* *in vivo*; its administration in agar suspensions, 1.5 mg/day for 3 days, cured 80% of infected mice which rose to 100% by 6.0 mg schedule (*Indian J. Med. Res.* 1988, 87, 395).

E. tirucalli L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 286).

12,20-Dideoxyphorbol-13-isobutyrate, 12-deoxy-4β-hydroxyphorbol-13-phenylacetate-20-acetate and euphol isolated from latex (*Herba Hung.* 1984, 23, 67; *Chem. Abstr.* 1985, 102, 218334 h); glut-5-en-3β-ol and cycloart-23-en-3β,25-diol isolated from stem bark (*Planta Med.* 1987, 53, 577); a new macrocyclic diterpene - tirucalicine - isolated from latex and its structure determined (*Heterocycles* 1988, 27, 2851); isolation and characterisation of a 31-nortriterpene - cycloeuphordenol - from latex (*Phytochemistry* 1988, 27, 2279); a new triterpene - cyclotirucanenol - isolated and its absolute configuration determined (*Z. Naturforsch.* 1988, 43B, 1059; *Chem. Abstr.* 1989, 111, 74738 d); euphorginol isolated from stem bark and its stereostructure determined (*Phytochemistry* 1989, 28, 1193).

NEW COMPOUNDS

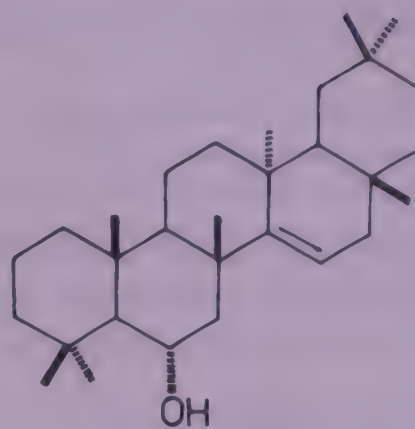


Cycloclitruananol

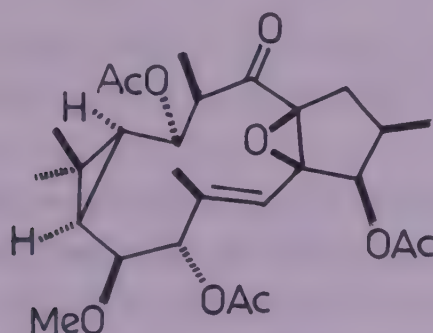
R = Me

Cycloclitruananol

R = H



Euphorginol



Tirucallicine

E. trigona Haw.; see *E. barnhartii* Croizat**EUPHRASIA** (Scrophulariaceae)*E. officinalis* L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 315).Luteolin, chrysoeriol, kaempferol-3-rutinoside, apigenin-7-rhamnogalactoside, luteolin-7-rhamnogalactoside, chrysoeriol-7-rhamnogalactoside and genkwanin-4'-arabinoglucoside isolated (*Herba Pol.* 1988, 34, 97; *Chem. Abstr.* 1989, 111, 180539 z).**EURYA** (Theaceae)*E. japonica* Thunb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 315).Cyanidin-3-acetylrutinoside identified in berries by chromatography (*Phytochemistry* 1988, 27, 3701).

EVOLVULUS (Convolvulaceae)

E. nummularicus (L.) L.; see *Volvulopsis nummularis* (L.) Roberty

EXCOECARIA (Euphorbiaceae)

E. indica (Willd.) Muell.-Arg. syn. *Sapium indicum* Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 288).

Sapiol (n-tetratriacontanol) and β -sitosterol isolated from leaves (*Bangladesh J. Sci. Ind. Res.* 1986, 21, 89; *Chem. Abstr.* 1988, 109, 125807 u).

FAGONIA (Zygophyllaceae)

F. arabica Hook.f.; see *F. schweinfurthii* Hadidi

F. cretica L.; see *F. schweinfurthii* Hadidi

F. indica Burm.f.; see *F. schweinfurthii* Hadidi

F. schweinfurthii Hadidi syn. *F. cretica* auct. (non L.), *F. arabica* sensu Hook.f. p.p., *F. indica* Burm.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 290).

Two new triterpenoid saponins isolated from aerial parts and characterised as 23,28-di-O- β -D-glucopyranosyl-taraxer-20-en-28-oic acid and 3 β ,28-di-O- β -D-glucopyranosyl-23-hydroxytaraxer-20-en-28-oic acid (*Phytochemistry* 1987, 26, 1487); quercetin and kaempferol from leaves and flowers (*Geobios* 1988, 15, 32; *Chem. Abstr.* 1988, 109, 89702 v); docosyl docosanoate isolated (*Arab Gulf J. Sci. Res.* 1989, 7A, 29; *Chem. Abstr.* 1989, 111, 191517 s).

FAGOPYRUM (Polygonaceae)

F. cymosum Meissn.; see *F. dibotrys* (D.Don) Hara

F. dibotrys (D.Don) Hara syn. *F. cymosum* Meissn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 290).

A new acylated glycoside - quercetin-3-O- β -D-(2''-O-p-hydroxycoumaroyl)glucopyranoside - isolated from leaves (*Fitoterapia* 1987, 58, 421).

F. esculentum Moench (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 291).

Isolation and characterisation of eriodictyol-5-O-methyl-7-O- β -D-glucopyranosyl(1 \rightarrow 4)-O- β -D-galactopyranoside from seeds (*Indian J. Chem.* 1987, 26B, 592); two new dihydroflavonol glycosides - aromadendrin-3-O-galactoside and taxifolin-3-O-xyloside - obtained from seeds (*Fitoterapia* 1989, 60, 84).

BIOLOGICAL ACTIVITY

A study on effect of quercetin on human basophil histamine release, triggered by six different stimuli, showed that it ($5.50\mu\text{M}$) exhibited predilection for inhibiting histamine release stimulated by IgE-dependent ligands (*Biochem. Pharmacol.* 1984, 33, 3333); quercetin and its 3-arabinorhamnoside (5.0 mg/kg) stimulated nonspecific immune response of mice infected with *Salmonella typhi* (*Farm. Zh.* 1987, 67; *Chem. Abstr.* 1988, 108, 124175 d); interferon detected in serum 18 hr after administration of single dose (0.1 g/kg) of quercetin or quercitrin in mice (*Acta Microbiol. Pol.* 1987, 36, 151; *Chem. Abstr.* 1987, 107, 126702 b); quercetin ($2.0\text{--}32.0\mu\text{g}$) produced dose-dependent positive inotropic effects and reduced heart rate in isolated rabbit heart. Responses to quercetin significantly inhibited by propranolol, potentiated by theophylline and attenuated by imidazole. Responses were altered by changes in concentrations of calcium, sodium or potassium chlorides; indicating that the quercetin-induced positive inotropic effects were due to increase in availability of intracellular calcium (*Indian J. Pharmacol.* 1987, 19, 100).

Quercetin when protected against oxidative degradation by ascorbate, exhibited anti-polio virus activity (*J. Gen. Virol.* 1988, 69, 1749; *Chem. Abstr.* 1988, 109, 66382 b); quercetin inhibited replication of herpes simplex virus in RK-13 cells (*Acta Virol.* 1988, 32, 522; *Chem. Abstr.* 1989, 111, 173 u); effects of feeding quercetin and flavone on hepatic drug-metabolising enzymes studied in rat; 14-days administration of flavone (0.25%) in feed, increased liver weight and hepatic cytochrome P450. It also increased hepatic monooxygenase and GSH transferase activities; UDP glucuronyltransferase activity was increased by both quercetin and flavone (*Prog. Clin. Biol. Res.* 1988, 280, 147; *Chem. Abstr.* 1988, 109, 221833 v); quercetin reduced concentrations of prostaglandin E₂ (PGE₂) and leukotriene B₄ (LTB₄) in pleural exudate induced by carrageenin given intrapleurally to rats. Leukocyte migration in exudate was also reduced; reduction of eicosanoids and leukocytes in exudate was dose-related. Quercetin also reduced LTB₄ synthesis in cells stimulated with ionophore A-23187 (*J. Pharm. Pharmacol.* 1988, 40, 293).

F. tataricum (L.) Gaertn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 117).

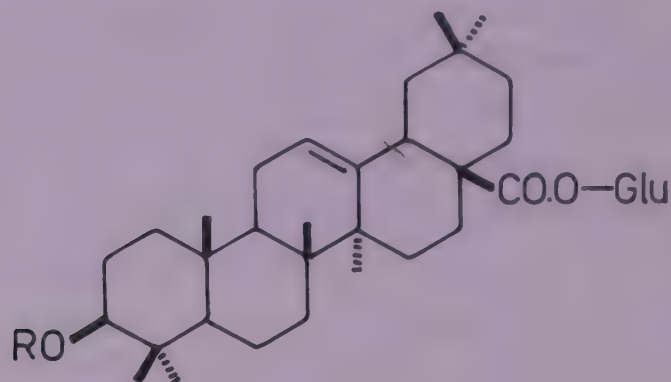
Determination of α -thujene (14.0), α -terpineol (15.8) and bornyl acetate (17.3%) in leaf oil by GLC (*Indian Perfum.* 1986, 30, 299; *Chem. Abstr.* 1986, 105, 120468 s); a new flavonoid isolated and characterised as 5,7,3',4'-tetra-O-methylquercetin-3-O- α -L-rhamnopyranosyl (1 \rightarrow 6)-O- β -D-glucopyranoside (*Fitoterapia* 1987, 58, 283).

FAGUS (Fagaceae)

F. sylvatica L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 317).

A new triterpene saponin (I) isolated from leaves and characterised as 3-O-[β -D-glucopyranosyl(1 \rightarrow 3)- β -D-glucuronopyranosyl]-olean-28-oic- β -D-glucopyranosyl ester; ginsenoside Ro also isolated (*Arch. Pharm.* 1987, 320, 153; *Chem. Abstr.* 1987, 106, 116544 s).

NEW COMPOUNDS



I

R = Gluc.acid(3 \rightarrow 1)Glu

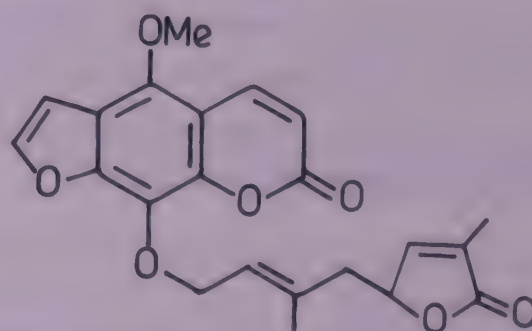
FERONIA (Rutaceae)

F. elephantum Correa; see *F. limonia* (L.) Swingle

F. limonia (L.) Swingle syn. *F. elephantum* Correa (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 292).

Umbelliferone, dictamnine, xanthotoxol, xanthotoxin, scoparone, isopimpinellin, isoimperatorin and marmin detected in pericarp by HPLC-GC (*Pharmazie* 1985, 40, 503; *Chem. Abstr.* 1985, 103, 175468 f); anisic acid isolated from leaf essential oil and its mass fragmentation determined (*Acta Cienc. Indica, Chem.* 1987, 13, 158; *Chem. Abstr.* 1989, 111, 36646 q); a new furanocoumarin - fernolin - isolated from roots together with aurapten, marmesin, bergapten and xanthotoxin; new compound characterised (*Phytochemistry* 1989, 28, 1229); estimation of methylchavicol (27.2), trans-anethole (10.94), thymol (24.4) and p-cymen-7-ol (7.3%) in leaf oil (*Planta Med.* 1989, 55, 199).

NEW COMPOUNDS

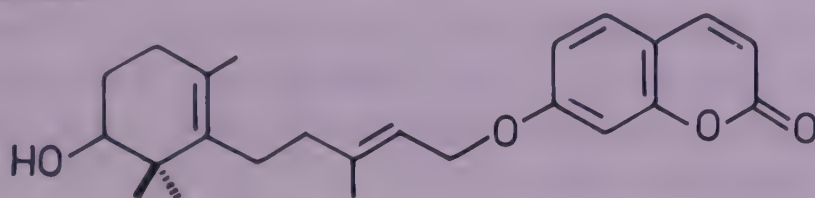


Fernolin

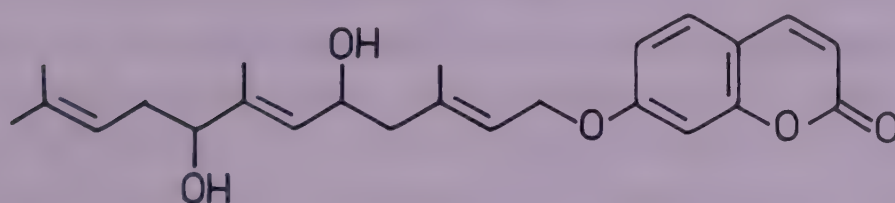
FERULA (Apiaceae)

F. assa-foetida L. syn. *F. foetida* Regel (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 292).

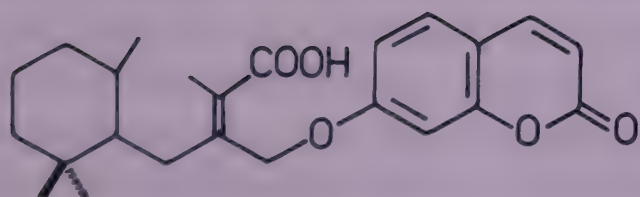
A new sesquiterpenoid coumarin - foetidin - isolated from roots (*Phytochemistry* 1985, 24, 869); two new coumarins - assafoetidin and ferocolicin - isolated from gum resin and characterised (*Tetrahedron Lett.* 1988, 29, 1557); isolation of three new compounds - asadisulphide, asacoumarin A and asacoumarin B - from resin prepared from roots and their structure elucidation by ¹³C NMR (*Phytochemistry* 1989, 28, 1761).

NEW COMPOUNDS

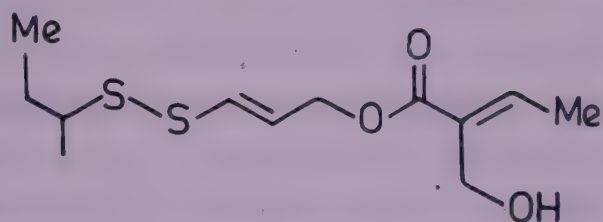
Assafoetidin



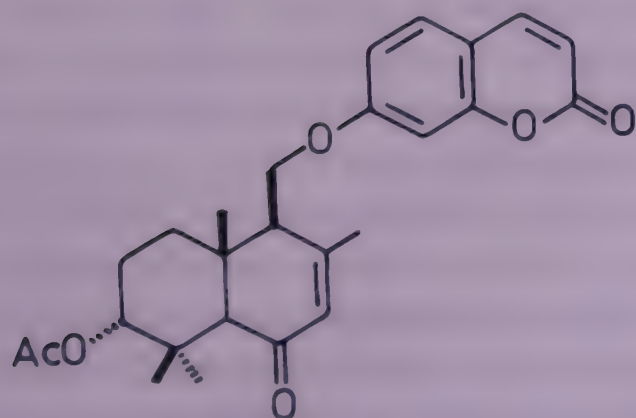
Asacoumarin A



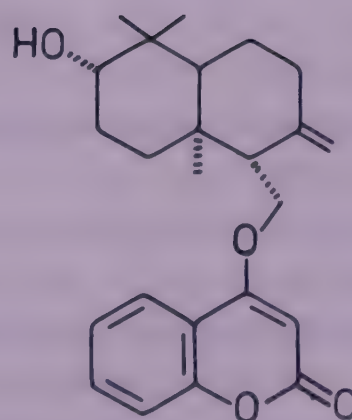
Asacoumarin B



Asadisulphide



Ferocolicin



Foetidin

BIOLOGICAL ACTIVITY

Luteolin exhibited antipolio virus activity which was comparable to that of ascorbate-stabilised quercetin (*J. Gen. Virol.* 1988, 69, 1749; *Chem. Abstr.* 1988, 109, 66382 b).

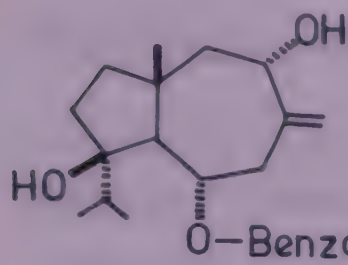
F. foetida Regel; see *F. assa-foetida* L.

F. jaeschkeana Vatke (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 319).

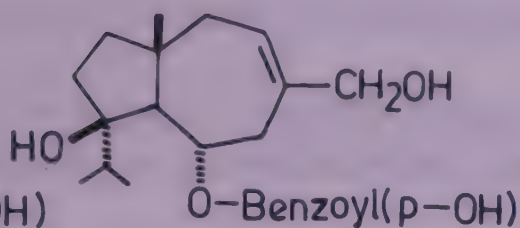
Effect of administration of ethanolic extract (0.2 g/kg for 5 days) on biochemical constituents in vital organs of pregnant rats studied. Protein content in kidney was decreased but increased in adrenal and glycogen content in kidney and adrenal was decreased. Significant increase in acid phosphatase was observed with simultaneous decrease of alkaline phosphatase in liver and kidney; however, spleen and adrenal showed increased alkaline phosphatase (*Indian J. Pharmacol.* 1989, 21, 129).

Oil from roots collected in May, contained α -pinene (9.5), β -pinene (5.2%) and limonene (tr) whereas oil from roots collected in July contained chamazulene (6.0-7.0%); fruit oil contained α -pinene (30.0), β -pinene (16.2%), limonene and car-3-ene as major components (*PAFAE J.* 1985, 7, 23; *Chem. Abstr.* 1985, 103, 92620 r); determination of car-3-ene (18.78), limonene (10.21), α -pinene (8.32), geranyl acetate (7.45), terpinyl acetate (6.26), α -terpineol (5.23), geraniol (4.07), γ -terpinene (3.86), camphene (2.56), p-cymene (2.16), myrcene (1.21) and unidentified sesquiterpenes (7.44%) in seed and stalk oil from Pakistani plant (*Pakistan J. Sci. Ind. Res.* 1987, 30, 667; *Chem. Abstr.* 1988, 108, 156238 t); two new sesquiterpenoids - feruginidin and ferugin - isolated from rhizomes and characterised (*J. Nat. Prod.* 1987, 50, 253); isolation of a new carotane derivative - feruginin - from rhizomes and its structure elucidation; jaeschkeanadiol, its 5α -(4-hydroxybenzoyl) and 5α -(3-methoxy-4-hydroxybenzoyl) derivatives also isolated (*Phytochemistry* 1987, 26, 449); new sesquiterpenes - feruone and 5α -(p-hydroxybenzoyl)ferutriol - isolated from rhizomes and their structures established (*Planta Med.* 1987, 53, 341); isolation and characterisation of three new compounds - p-menth-3-en-1,2-diol, p-menth-4-en-1,2-diol and p-menth-8-en-1,2-diol - from rhizome oil (*Phytochemistry* 1988, 27, 936); two new sesquiterpenes - 2,3-epoxyjaeschkeana-diol- 5α -vanilate and 2β -hydroxy-3,4-epoxyjaeschkeanadiol - isolated along with 5α -(4-hydroxybenzoate) of lancesrol (*J. Nat. Prod.* 1988, 51, 771); three new monoterpene alcohols - p-menth-1 β -2 α -diol, p-menth-1 β ,4 α -diol and 2β -hydroxy-1,4-cineole - isolated from rhizome essential oil and characterised; camphor, car-3-ene, carvacrol, carvone, cubenol, p-cymene, p-cymen-7-ol, epicubenol, germacrene D, α -gurjunene, isolongifolene, limonene, p-menth-3-en-1,2-diol, p-menth-4-en-1,2-diol, cis-ocimene, α -phellandrene, α -pinene, δ -selinene, α -terpineol, terpinen-4-ol, terpin-4-yl acetate, α -thujene and α -thujone also isolated (*Phytochemistry* 1989, 28, 634).

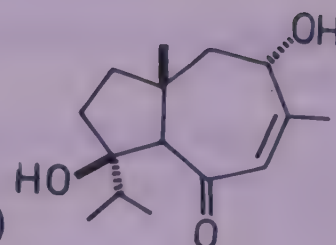
NEW COMPOUNDS



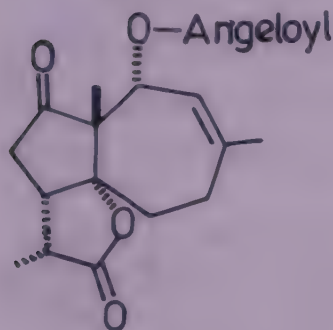
Ferugin



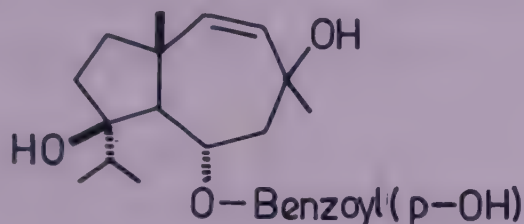
Feruginidin



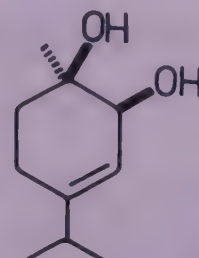
Feruone



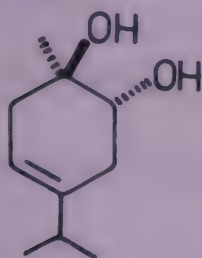
Feruginin



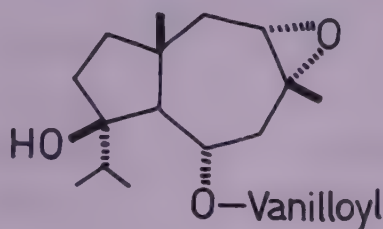
5α-(p-Hydroxybenzoyl)ferutriol



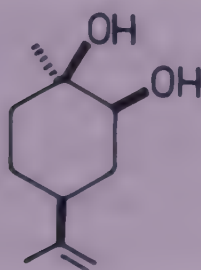
p-Menth-3-en-1,2-diol



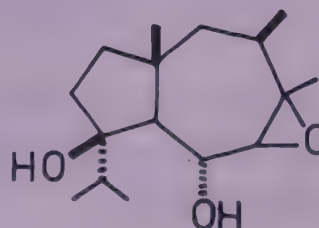
p-Menth-4-en-1,2-diol



2,3-Epoxyjaeschkeanadiol-5α-vanillate



p-Menth-8-en-1,2-diol



2β-Hydroxy-3,4-epoxyjaeschkeanadiol

FESTUCA (Poaceae)

F. arundinacea Schreb.

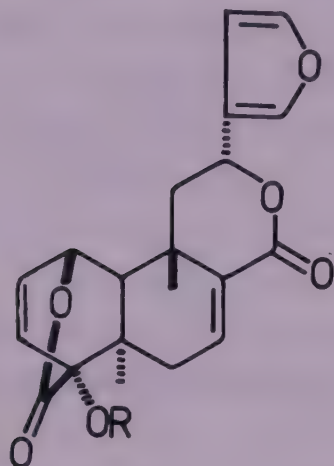
Cinnamic, ferulic, gallic, gentisic and syringic acids isolated from root exudate (*Trans. Ky. Acad. Sci.* 1985, 46, 51; *Chem. Abstr.* 1985, 103, 19895 n).

Distribution : Throughout Himalayas, alt. 2400-3000 m.

FIBRAUREA (Menispermaceae)

F. tinctoria Lour. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 293).

Isolation of three new furanoditerpenes - tinophylloside, fibleucinoside and fibraurinoside - and their structure elucidation; fibleucin and fibraurin also isolated (*Phytochemistry* 1986, 25, 905).

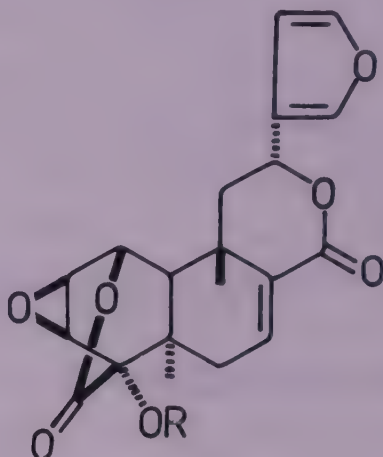
NEW COMPOUNDS

Fibleucin

R = H

Fibleucinoside

R = Glu

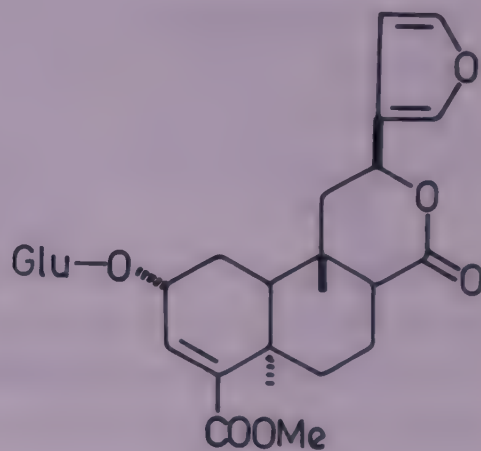


Fibraurin

R = H

Fibraurinoside

R = Glu



Tinophylloside

FICUS (Moraceae)

F. carica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 294).

Isolation of schaftoside and isoschaftoside from leaves (*Z. Naturforsch.* 1985, 40C, 8; *Chem. Abstr.* 1985, 102, 128904 q); baurenol and 24-methylenecycloartanol isolated from leaves (*Planta Med.* 1988, 54, 481).

F. glomerata Roxb.; see *F. racemosa* L.

F. hispida L.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 294).

Minimum erythemic dose (MED) of fruits in fair complexioned human volunteers using UV lamp studied. Oral administration of unripe fruit powder (12.0 g twice a day for three days) caused photosensitization (*J. Res. Ayurveda & Siddha* 1983, 4, 34).

F. infectoria Roxb.; see *F. virens* Ait.

F. lacor Buch.-Ham.; see *F. virens* Ait.

F. microcarpa L.f. syn. *F. retusa* sensu Hook.f. (non L.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 119).

Lupenyl acetate, friedelin, epifriedelinol, glutinol, taraxerol, oleanolic acid and two pentacyclic triterpenoids isolated from leaves (*Bull. Coll. Sci., Univ. Ryukyus* 1987, 44, 75; *Chem. Abstr.* 1988, 109, 187306 p).

F. racemosa L. syn. *F. glomerata* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 295).

β -Sitosterol glucoside, friedelin and lupeol isolated from stem bark (*Himalayan Chem. Pharm. Bull.* 1985, 2, 13; *Chem. Abstr.* 1986, 104, 183307 p).

F. retusa L.; see *F. microcarpa* L.f.

F. virens Ait. syn. *F. lacor* Buch.-Ham., *F. infectoria* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 295).

Pharmacognostic studies of bark (*Indian Drugs* 1989, 26, 205).

Methyl ricinolate, β -Sitosterol, lanosterol, caffeic acid and bergenin isolated from stem bark (*J. Indian Chem. Soc.* 1989, 66, 141).

FINLAYSONIA (Periplocaceae)

F. obovata Wall.

B. - Dudhilata.

Lupeol acetate isolated from bark; α - and β -amyrin acetates and stigmasterol isolated from leaves whereas ursolic acid and β -sitosterol found both in bark and leaves (*J. Indian Chem. Soc.* 1985, 62, 629).

Distribution : Sunderbans in West Bengal.

FIRMIANA (Sterculiaceae)

F. fulgens (Wall. ex Mast.) Corner syn. *Sterculia fulgens* Wall. ex Mast., *S. pallens* Wall. ex King (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 295).

Sterculic (6.97) and malvalic (3.87%) acids determined in seed oil (*J. Am. Oil Chem. Soc.* 1986, 63, 1191; *Chem. Abstr.* 1986, 105, 206282 p).

FISSENDOCARPA (Onagraceae)

F. linifolia (Vahl) Bennet syn. *Jussiaea linifolia* Vahl, *Ludwigia hyssopifolia* (G. Don) Exell

Orientin, iso-orientin, vitexin and isovitexin isolated (*Shih Ta Hsueh Pao Pao* 1985, 30, 547; *Chem. Abstr.* 1986, 104, 31779 f).

Distribution : Bihar, Andhra Pradesh, Tamil Nadu and Kerala.

FITZROYA (Cupressaceae)

F. patagonica Hook.f. ex Lindl.

Amentoflavone, O-methylamentoflavone, cupressuflavone, robustaflavone, hinokiflavone and apigenin detected in leaves (*Indian J. Chem.* 1985, 24B, 321); podocarpusflavone A and isocryptomerin isolated from leaves (*Curr. Sci.* 1987, 56, 480).

Distribution : Native of Chile; introduced into India in the Nilgiris in gardens.

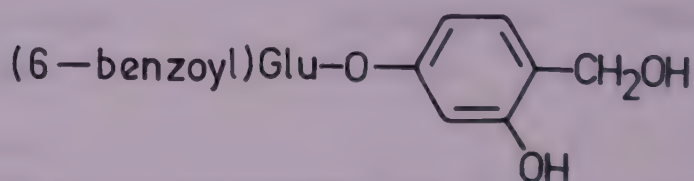
FLACOURTIA (Flacourtiaceae)

F. catapracta Roxb. ex Willd.; see *F. jangomas* (Lour.) Raeusch.

F. indica (Burm.f.) Merr. syn. *F. ramontchii* L'Herit., *F. ramontchii* L'Herit. var. *sapida* (Roxb.) Hook.f. & Thoms., *F. ramontchii* L'Herit. var. *latifolia* Hook.f. & Thoms., *F. ramontchii* L'Herit. var. *occidentalis* Hook.f. & Thoms., *F. sepriaria* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 120).

A new phenolic glucoside ester - flacourtin - isolated from bark and its structure determined (*Phytochemistry* 1987, 26, 3090).

NEW COMPOUNDS

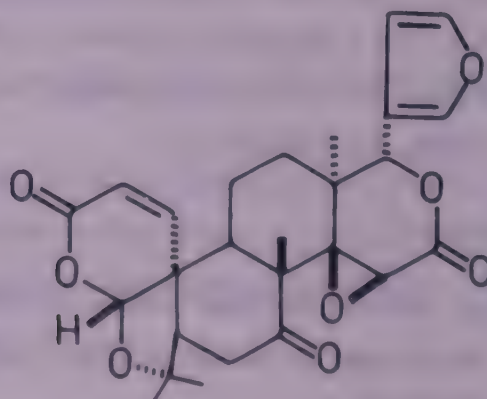


Flacourtin

F. jangomas (Lour.) Raeusch. syn. *F. catapracta* Roxb. ex Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 120).

A novel limonoid - jangomolide - isolated from stem and bark along with ostruthin and limonin and its structure determined (*Phytochemistry* 1984, 23, 1269).

NEW COMPOUNDS



Jangomolide

F. ramontchii L'Herit.; see *F. indica* (Burm.f.) Merr.

F. ramontchii L'Herit. var. *latifolia* Hook.f. & Thoms.; see *F. indica* (Burm.f.) Merr.

F. ramontchii L'Herit. var. *occidentalis* Hook.f. & Thoms.; see *F. indica* (Burm.f.) Merr.

F. ramontchii L'Herit. var. *sapida* (Roxb.) Hook.f. & Thoms.; see *F. indica* (Burm.f.) Merr.

F. sepiaria Roxb.; see *F. indica* (Burm.f.) Merr.

FLEMINGIA (Papilionaceae)

F. congesta Ait.; see *F. macrophylla* (Willd.) O. Ktze. ex Merr.

F. congesta Ait. var. *latifolia* (Roxb.) Baker; see *F. macrophylla* (Willd.) O. Ktze. ex Merr.

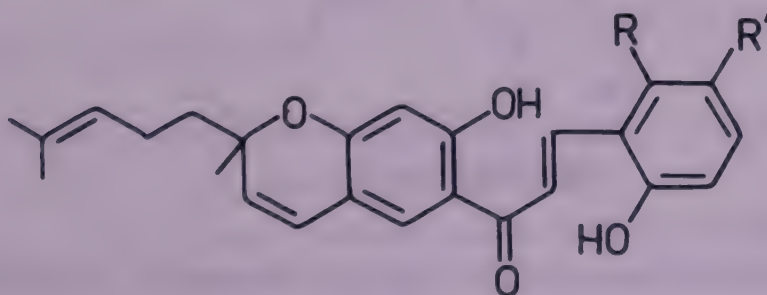
F. congesta Ait. var. *semialata* (Roxb.) Baker; see *F. macrophylla* (Willd.) O. Ktze. ex Merr.

F. congesta Ait. var. *wightiana* (W. & A.) Baker; see *F. macrophylla* (Willd.) O. Ktze. ex Merr.

F. macrophylla (Willd.) O. Ktze. ex Merr. syn. *F. congesta* Ait., *F. congesta* Ait. var. *latifolia* (Roxb.) Baker, *F. congesta* Ait. var. *semialata* (Roxb.) Baker, *F. congesta* Ait. var. *wightiana* (W. & A.) Baker, *F. stricta* Roxb., *F. wallichii* W. & A., *F. rhodocarpa* Baker, *Moghania macrophylla* (Willd.) O. Ktze. (*Maughania*) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 295).

Flemiwallichins A and B isolated from leaves and characterised (*Indian J. Chem.* 1975, 13, 1000); isolation and structures elucidation of flemiwallichins D, E and F from leaves (*Indian J. Chem.* 1985, 24B, 217); structure of flemi-flavanone D revised (*Phytochemistry* 1985, 24, 2885).

NEW COMPOUNDS

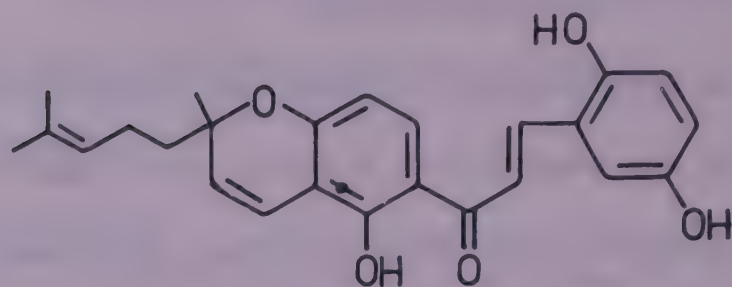


Flemiwallichin A

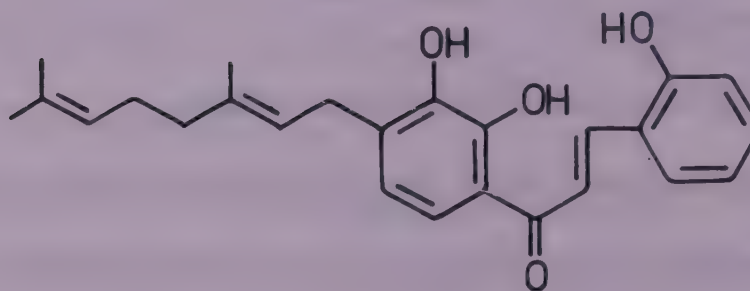
R = OH, R' = H

Flemiwallichin B

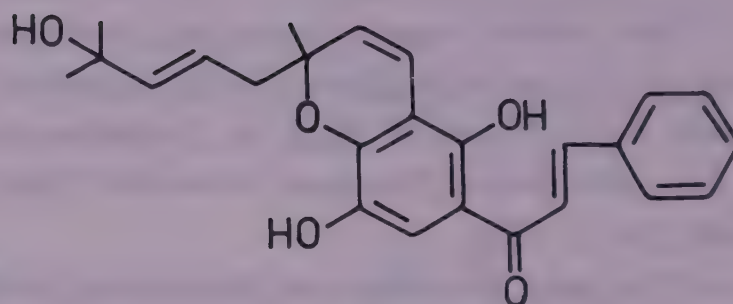
R = H, R' = OH



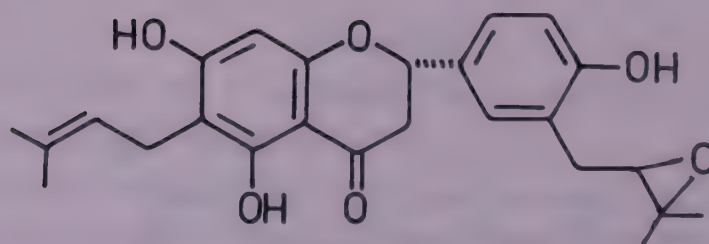
Flemiwallichin D



Flemiwallichin E



Flemiwallichin F



Flemiflavanone D

BIOLOGICAL ACTIVITY

Flemiflavanone D exhibited antimicrobial activity *in vitro* against *Staphylococcus aureus* and *Mycobacterium smegmatis* (*Phytochemistry* 1985, 24, 2885).

F. rhodocarpa Baker; see *F. macrophylla* (Willd.) O. Ktze. ex Merr.

F. stricta Roxb.; see *F. macrophylla* (Willd.) O. Ktze. ex Merr.

F. wallichii W. & A.; see *F. macrophylla* (Willd.) O. Ktze. ex Merr.

FLEURYA (Urticaceae)

F. interrupta (L.) Gaud.; see *Laportea interrupta* (L.) Chew

FLUEGGEA (Euphorbiaceae)

F. microcarpa Blume; see *Securinega virosa* (Roxb. ex Willd.) Baillon

F. microcarpa (Roxb. ex Willd.) Baillon; see *Securinega virosa* (Roxb. ex Willd.) Baillon

F. virosa (Roxb. ex Willd.) Baillon; see *Securinega virosa* (Roxb. ex Willd.) Baillon

FOENICULUM (Apiaceae)

F. vulgare Mill. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 298).

Oral administration of seed extract for 15 days to male rats decreased total protein concentration in testes and vas deferens but increased it in seminal vesicles and prostate gland; acid and alkaline phosphatase activities decreased in all these tissues. In female rats, moderate doses increased weight of mammary glands but higher doses increased weight of oviduct, endometrium, myometrium, cervix and vagina (*Indian J. Physiol. Pharmacol.* 1985, 29, 21); seed extract at 50.0-250.0 μ g/100 g/day for 10 days given to ovariectomised rats, led to significant increase in organ weights and nucleic acids, protein concentrations in cervix and vagina (*Indian J. Med. Res.* 1988, 87, 364).

Essential oils yield of plants from different parts of Turkey varied from 1.7 to 2.5%; trans-anethole (75.68 - 86.52), limonene (4.25 - 9.15), estragole (3.25 - 5.21), fenchone (1.28 - 4.75), γ -terpinene (0.86 - 1.57), α -pinene (0.47 - 1.14) and linalool (0.07 - 0.63%) found to be present (*Doga Bilim Derg. Seri D2* 1986, 10, 1; *Chem. Abstr.* 1987, 106, 201518 f; *Doga Tarim Ormancilik Seri* 1986, 10, 301; *Chem. Abstr.* 1987, 106, 38206 s).

FORTUNELLA (Rutaceae)

F. japonica (Thunb.) Swingle syn. *Citrus japonica* Thunb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 325).

Coniferin, syringin, dehydrodiconiferyl alcohol-4 β -glucoside and citrusins A, B, C and D isolated from peelings (*Nippon Nogei Kagaku Kaishi* 1988, 62, 1067; *Chem. Abstr.* 1988, 109, 146351 f).

BIOLOGICAL ACTIVITY

Coniferin and syringin injected i.v. into SHR-SP rats (1.0 mg/100 g) raised blood pressure whereas dehydrodiconiferyl alcohol- 4 β -glucoside, citrusins A, C and D at same doses lowered

blood pressure (*Nippon Nogei Kagaku Kaishi* 1988, 62, 1067; *Chem. Abstr.* 1988, 109, 146351 f).

FRAGARIA (Rosaceae)

F. chiloensis (L.) Duchesne (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 189).

Steroidal fraction of fruits contained isofucosterol (40.0%), sitosterol, campesterol, cholesterol and stigmasterol (*Phytochemistry* 1989, 28, 1276).

F. indica (Andr.) Wolf. syn. *Duchesnea indica* (Andr.) Focke

Eng. - Moek strawberry.

Methoxydehydrocholesterol isolated (*Nonchong-Han'guk Saeghwat Kwahak Yonguwon* 1985, 35, 129; *Chem. Abstr.* 1986, 104, 126494 y).

Distribution : Himalayas, Khasia Hills, Western Ghats and Nilgiris, ascending to 2400 m.

F. vesca L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 189).

Procyanidins B1, B2 and B5, (+)catechin and (-)epicatechin isolated from roots and identified by HPLC (*Phytochemistry* 1986, 26, 261; *Chem. Pharm. Bull.* 1988, 36, 828).

BIOLOGICAL ACTIVITY

Procyanidins exhibited antibacterial and marked angioprotective properties (*Chem. Pharm. Bull.* 1988, 36, 828).

FRANCOEURIA (Asteraceae)

F. crispa Cass.; see *Pulicaria crispa* (Forsk.) Benth. & Hook.

FRAXINUS (Oleaceae)

F. floribunda Wall. ex Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 299).

Fraxetin, fraxin, aesculetin, aesculin, mannitol and tyrosol isolated from bark (*Indian J. Pharm. Sci.* 1984, 46, 176).

FRITILLARIA (Liliaceae)

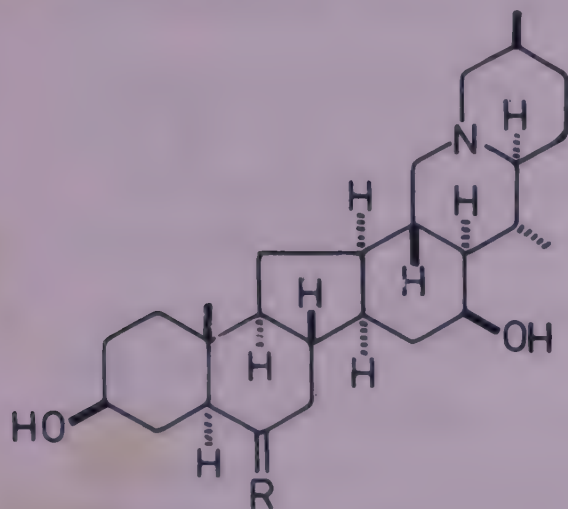
F. delavayii Franch.

Two new D/E-cis-5 α -cevanine alkaloids - delavine and delavinone - isolated along with imperialine; crystal structure of delavinone determined (*Chem. Pharm. Bull.* 1985, 33, 2614); isolation of a novel alkaloid - chuanbeinone - from Chinese plant and determination of its absolute configuration (*Tetrahedron Lett.* 1986, 27, 2387); delafrinone, delafrine and (22R,25S)

solanid-5-enine- $3\beta,5\alpha,6\beta$ -triol (I) isolated from bulbs of Chinese plant and characterised (*Chem. Pharm. Bull.* 1988, 36, 4700).

Distribution : Sikkim, alt. 3000-3500 m.

NEW COMPOUNDS

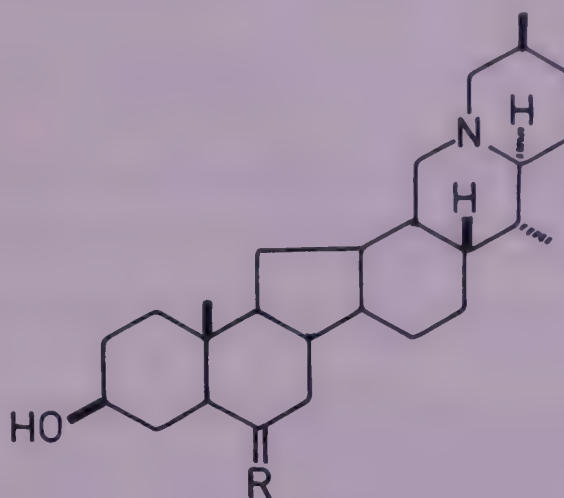


Delafrinone

R = O

Delafrine

R = β -OH,H

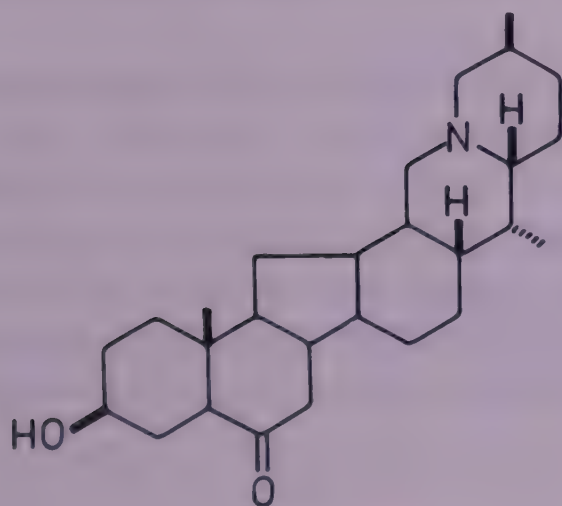


Delavine

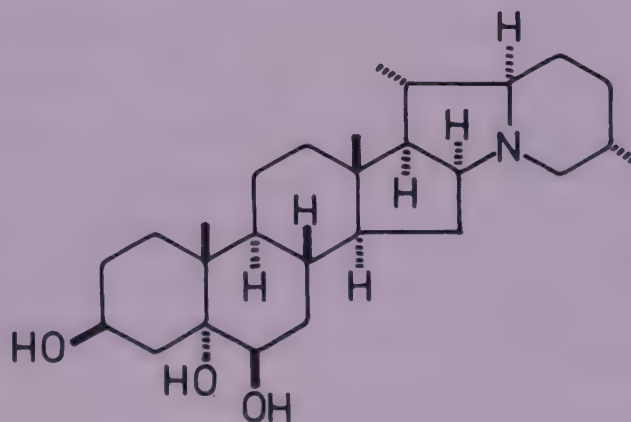
R = β -OH,H

Delavinone

R = O



Chuanbeinone

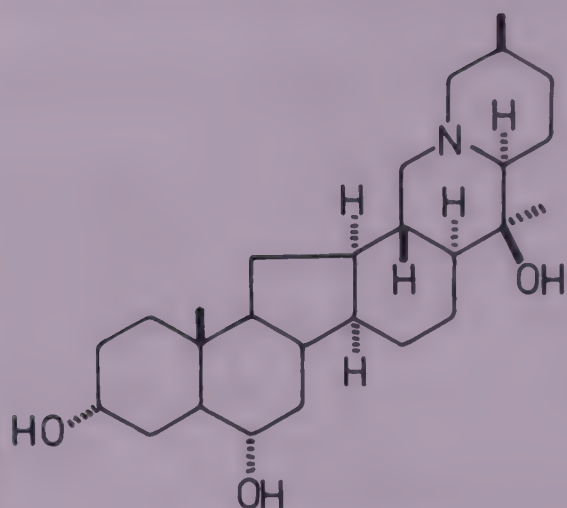


I

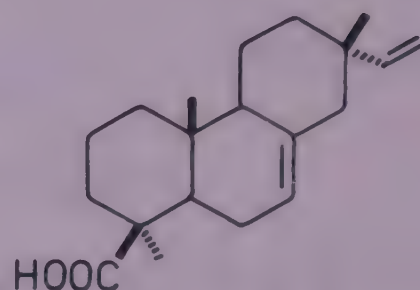
F. imperialis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 300).

Crystal structure determination of isobaimonidine (*Acta Crystallogr., Cryst. Struct. Commun.* 1985, 41C, 392; *Chem. Abstr.* 1987, 106, 33379 r); a new pimaradiene diterpene - oblongifolic acid - isolated from fresh bulbs and characterised (*Planta Med.* 1988, 54, 366).

NEW COMPOUNDS



Isobaimonidine



Oblongifolic acid

BIOLOGICAL ACTIVITY

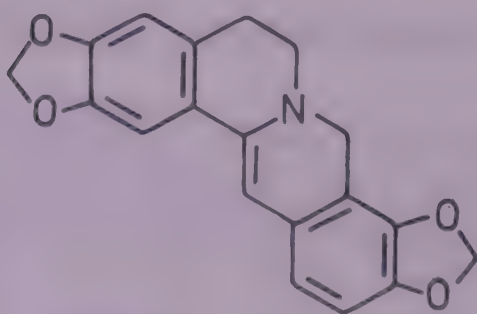
Imperialine shown to be highly cardioselective in rats, rabbits and mice and appears to be a M_2 -cholinolytic agent (*Dokl. Akad. Nauk Uz SSR* 1988, 48; *Chem. Abstr.* 1988, 109, 163181 t).

FUMARIA (Fumariaceae)

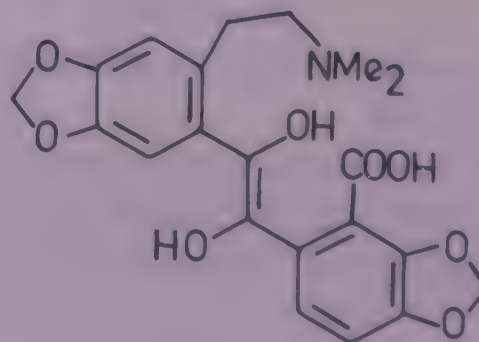
F. indica (Hassk.) Pugsley (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 300).

Structures of narceimine and narlumidine confirmed by chemical studies; protopine nitrate, tetrahydrocoptisine, (+)adlumidine and norsanguinarine isolated (*Planta Med.* 1984, 50, 481); crystal structure of protopine by X-ray analysis (*Huaxue Xuebao* 1985, 43, 310; *Chem. Abstr.* 1985, 103, 71565 u); a new alkaloid - dihydrocoptisine - isolated from seeds and its structure elucidated; in addition, norsanguinarine, adlumidine and bicuculline also obtained (*Phamazie* 1987, 42, 745; *Chem. Abstr.* 1988, 108, 109566 p); isolation of a new seco-phthalide-isoquinoline alkaloid - narceimicine - from seeds and its characterisation (*Phytochemistry* 1988, 27, 1918).

NEW COMPOUNDS



Dihydrocoptisine



Narceimicine

BIOLOGICAL ACTIVITY

Fumarilline produced dose-related anticonvulsant effect against maximal electroshock-induced seizures in rats; at 10.0 to 50.0 mg/kg, i.p., it produced moderate to marked passivity and decrease in motility. It is a CNS-depressant without any significant muscle relaxation activity (*Planta Med.* 1986, 52, 324).

F. officinalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 301).

Cryptopine (0.31%) major component in total alkaloids (1.25%) from aerial parts of Turkish plant (*Gazi Univ. Eczacilik Fak. Derg.* 1985, 2, 45; *Chem. Abstr.* 1985, 103, 211207 f).

F. parviflora Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 301).

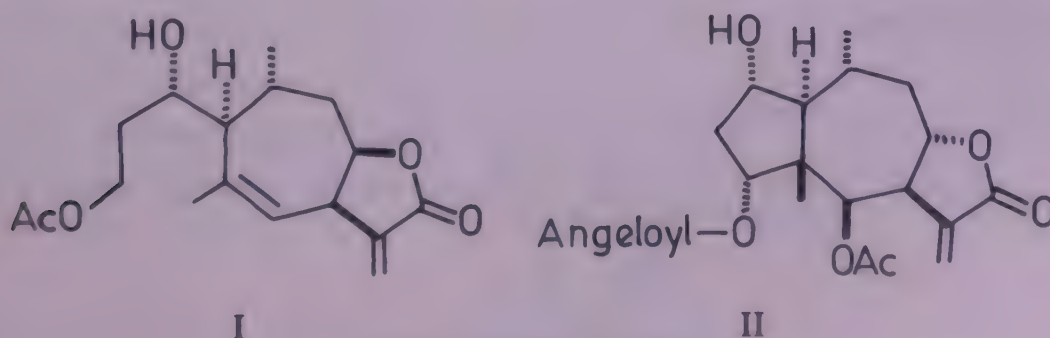
(-)-Stylophine, (-)-canadine, coptisine, berberine, protopine, cryptopine, chelidonine, bulbocapnine, papaverine and parfumine isolated (*Planta Med.* 1985, 51, 319); rhoeagenine isolated from leaves and twigs (*J. Nat. Prod.* 1985, 48, 1000); synthesis of stylophine (*J. Org. Chem.* 1987, 52, 704).

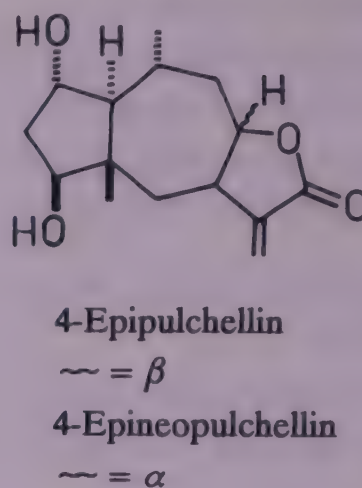
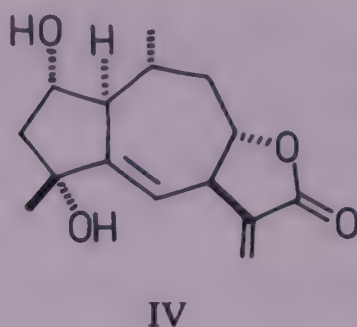
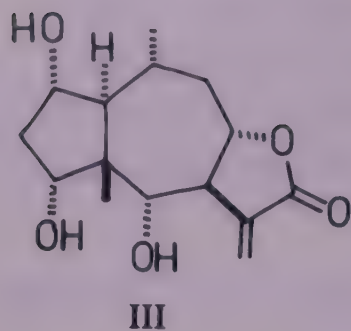
GAILLARDIA (Asteraceae)

G. pulchella Fouger (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 304).

Five sesquiterpene lactones - 4-O-acetyl-4,5-seco-neopulchell-5-ene (I), 6 β -acetoxy-pulchellin-4-O-angelate (II), 6 α -hydroxypulchellin (III) and its 4-O-angelate (pulcheloid C), 2 α ,4 α -dihydroxy-1 α ,10 β H-guaia-5,11(13)-diene-8 α ,12-olide (IV) - isolated from aerial parts and characterised; 2-O-acetyl-4,5-seco-neopulchell-5-ene, pulchellin, 6 β ,9 β -dihydroxypulchellin-2-O-isovalerate, 4-O-acetyl-6 β ,9 β -dihydroxypulchellin-2-O-angelate, 6 β ,9 β -diacetylpulchellin, 6 α -angeloyloxypulchellin and its 4-O-isovalerate, neopulchellin and 6 α -hydroxyneopulchellin also isolated; crystal structure of 6 α -hydroxyneopulchellin-4-O-angelate (*Phytochemistry* 1988, 27, 2887); isolation and structure elucidation of two new pseudo-guaianolides - 4-epipulchellin and 4-epineopulchellin (*Heterocycles* 1988, 27, 83).

NEW COMPOUNDS





GALIUM (Rubiaceae)

G. aparine L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 332).

Isolation and characterisation of two new alkaloids - (-)-1-hydroxydeoxypeganine and (-)-8-hydroxy-2,3-dehydrodeoxypeganine - along with vasicinone, protopine and harmine (*Gazi Univ. Eczacilik Fak. Derg.* 1988, 5, 33; *Chem. Abstr.* 1989, 110, 111673 f).

G. verum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 305).

Iridoid glycosides - 6-acetylscandoside, scandoside methyl ester, deacetyldaphylloside and geniposide - isolated from aerial parts (*F.E.C.S. Int. Conf. Chem. Biotechnol. Biol. Act. Nat. Prod.* [Proc.], 3rd 1985, 4, 131; *Chem. Abstr.* 1989, 110, 36718 u).

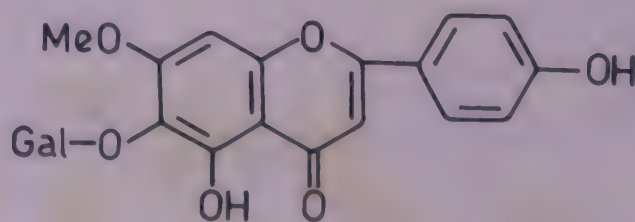
GARCINIA (Clusiaceae)

G. andamanica King

Isolation and structure elucidation of a flavone glycoside - sorbifolin-6-galactoside - from leaves along with scutellarein-7-diglucoside (*Phytochemistry* 1986, 25, 2900); another new flavone glycoside isolated from leaves and characterised as 4'-hydroxywogonin-7-neohesperidoside (*Phytochemistry* 1987, 26, 1843).

Distribution : Andaman Islands.

NEW COMPOUNDS

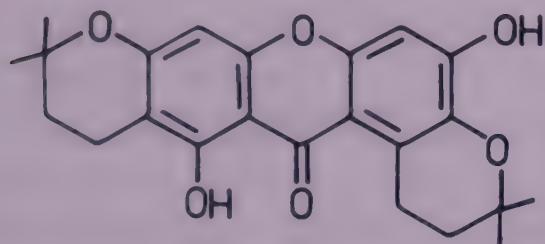


Sorbifolin-6-galactoside

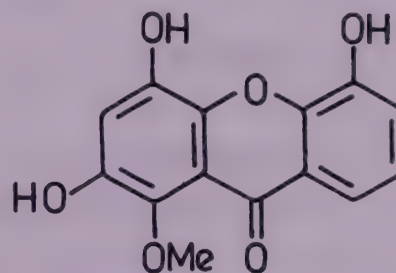
G. mangostana L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 306).

A new xanthone - garcinone D - isolated from fruit hulls and its structure elucidated (*Indian J. Chem.* 1986, 25B, 1157); isolation of 1,5,8-trihydroxy-3-methoxy-2-(3-methyl-2-butenyl)xanthone and 1,6-dihydroxy-3-methoxy-2-(3-methyl-2-butenyl)xanthone from leaves and their characterisation (*Chem. Ind.* 1987, 418; *Phytochemistry* 1988, 27, 3694); mangostin, β - and γ -mangostins, gartanin and 1- and 3-isomangostins and their hydrates obtained from fruit pericarp, whereas mangostin, calabaxanthone, demethylcalabaxanthone, 2-(γ,γ -dimethylallyl)-1,7-dihydroxy-3-methoxyxanthone and 2,8-bis(γ,γ -dimethylallyl)-1,3,7-trihydroxyxanthone isolated from seed arils (*J. Nat. Prod.* 1987, 50, 474); two new xanthones - BR-xanthone A and BR-xanthone B - isolated from fruit hulls and their structures elucidated; mangostin, gartanin and garcinone also isolated (*Phytochemistry* 1988, 27, 1552).

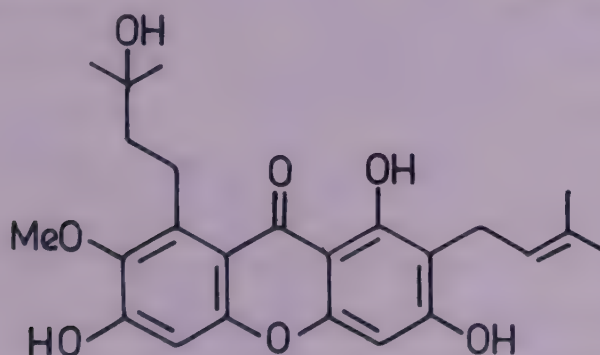
NEW COMPOUNDS



BR-Xanthone A



BR-Xanthone B



Garcinone D

BIOLOGICAL ACTIVITY

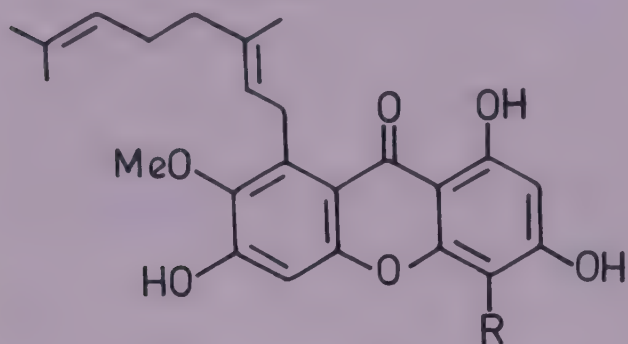
Mangostin, γ -mangostin, 1-isomangostin, 3-isomangostin and gartanin were *in vitro* tested for their antimicrobial activities. Mangostin was found to be the most potent against both normal and penicillin-resistant strains of *Staphylococcus aureus*. Mangostin, γ -mangostin and gartanin showed moderate activity against *Trichophyton mentagrophytes* and *Microsporum gypseum* (*J. Sci. Soc. Thailand* 1986, 12, 239; *Chem. Abstr.* 1987, 107, 151189 x).

G. nervosa Miq.

Three new xanthenes - isocowanin, isocowanol and nervosaxanthone - isolated from stem bark and characterised (*Phytochemistry* 1986, 25, 2351); isolation and structure elucidation of a new biflavonoid (I) from leaves (*Phytochemistry* 1988, 27, 3332).

Distribution : Andaman and Nicobar Islands.

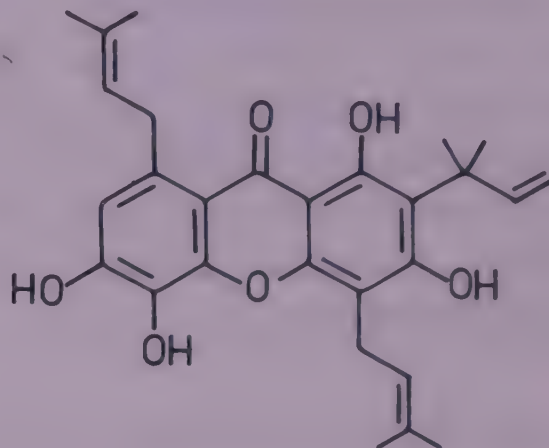
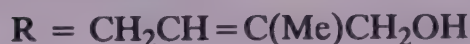
NEW COMPOUNDS



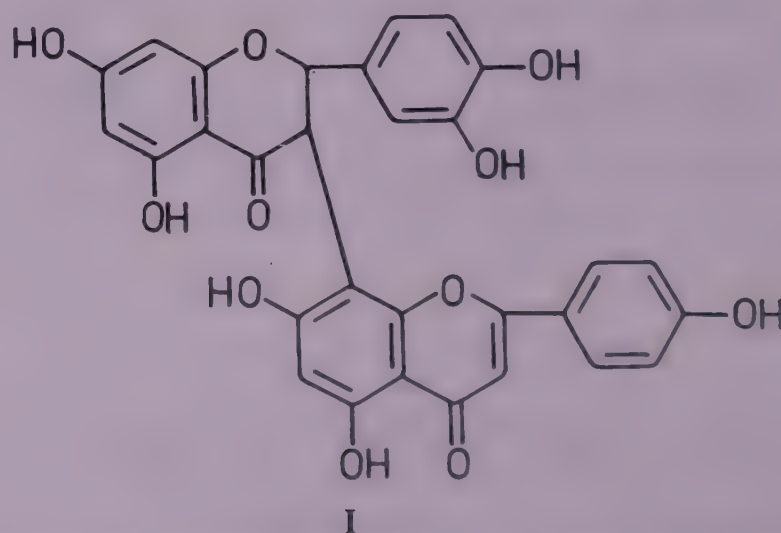
Isocowanin



Isocowanol



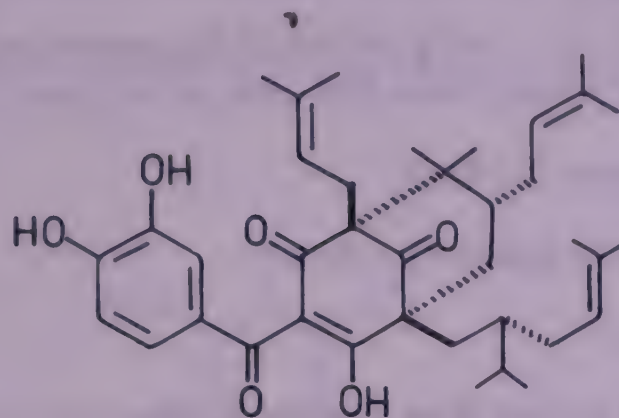
Nervosaxanthone



G. pedunculata Roxb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 335).

A new polyisoprenylated benzophenone - pedunculol - along with garcinol and cambogin isolated from pericarp and structure of new compound elucidated (*Phytochemistry* 1989, 28, 1233).

NEW COMPOUNDS



Pedunculol

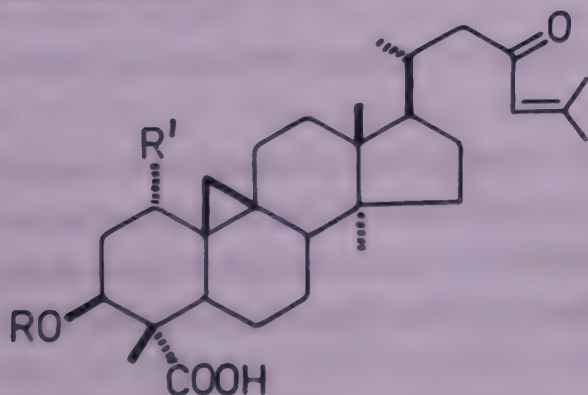
GARDENIA(Rubiaceae)

G. angusta (L.) Merr. syn. *G. jasminoides* Ellis, *G. florida* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 308).

Flower extract terminated early pregnancy in rats (*Huaxue Xuebao* 1987, 45, 301; *Chem. Abstr.* 1987, 107, 83740 t).

A purified pigment (3.1%) obtained from fruits (Jpn. 59,144,797 (1984) Feb. 07; *Chem. Abstr.* 1985, 102, 21470 t); a new 5-lipoxygenase inhibitor - 3,4-dicaffeoyl-5-(3-hydroxy-3-methylglutaroyl)quinic acid (I) - isolated from fruits (*Chem. Pharm. Bull.* 1986, 34, 1419); additional 5-lipoxygenase inhibitors - chlorogenic acid (II), 6''-p-coumaroylgenipin gentio-bioside (III), 3,4-di-O-caffeoylquinic acid (IV) and 3,5-di-O-caffeoyl-4-O-(3-hydroxy-3-methylglutaroyl)quinic acid (V) also isolated from fruits (*Chem. Pharm. Bull.* 1986, 36, 87); 3-O-caffeoyl-4-O-sinapoylquinic acid (VI) obtained from fruits (*Chem. Pharm. Bull.* 1987, 35, 2133; *ibid.* 1988, 36, 87); acetyl oleanolic acid, mannitol and stigmasterol present in stems and roots (*Zhongyao Tongbao* 1986, 11, 620; *Chem. Abstr.* 1987, 106, 15793 s); isolation of new triterpenoid - gardenolic acid A - from flowers and its structure elucidation (*Youji Huaxue* 1989, 9, 263; *Chem. Abstr.* 1989, 111, 228956 n); two new cycloartane triterpenoids - gardenic acid and gardenolic acid B - isolated from flowers and their structures determined (*Huaxue Xuebao* 1987, 45, 301; *Chem. Abstr.* 1987, 107, 83740 t).

NEW COMPOUNDS



Gardenolic acid A

R,R' = H

Gardenolic acid B

R = H, R' = OH

BIOLOGICAL ACTIVITY

Compounds I, II, III, IV, V and VI inhibited 5-lipoxygenase activity; compound IV was the most potent inhibitor (*Chem. Pharm. Bull.* 1986, 34, 1419; *ibid.* 1988, 36, 87)

G. florida L.; see *G. angusta* (L.) Merr.

G. jasminoides Ellis; see *G. angusta* (L.) Merr.

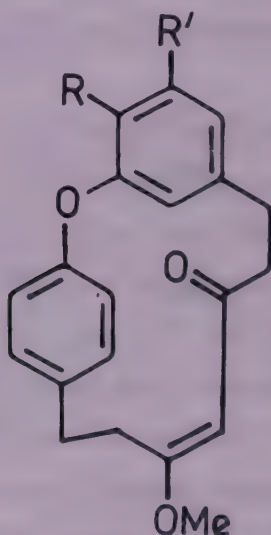
GARUGA (Burseraceae)

G. floribunda Decne. var. *gamblei* (King & Smith) Kalkman syn. *G. gamblei* King & Smith

Two new macrocyclic biaryl ethers - garugamblin 1 and garugamblin 2 - isolated from bark and their structures established (*Monatsh. Chem.* 1988, 119, 1047; *Chem. Abstr.* 1989, 110, 36731 t).

Distribution : Sikkim and Uttar Pradesh.

NEW COMPOUNDS



Garugamblin 1

R = OMe, R' = H

Garugamblin 2

R R' = -OCH₂O-

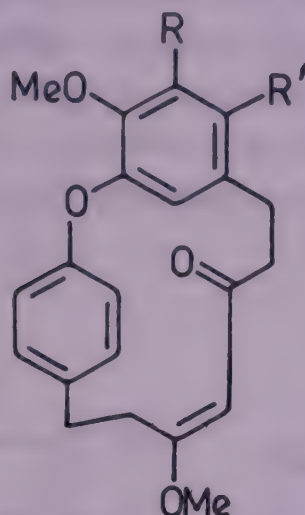
G. gamblei King & Smith; see *G. floribunda* Decne. var. *gamblei* (King & Smith) Kalkman

G. pinnata Roxb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 338).

A new alcohol - 6-propylnonadecan-7-ol - isolated from leaves and stem bark and characterised (*J. Indian Chem. Soc.* 1984, 61, 1007); isolation of α - and β -amyrins, butyro-spermol and dammaradienol from resin (*Curr. Sci.* 1985, 54, 631); isolation and structure determination of a new macrocyclic biphenyl ether - garuganin I - from leaves and stem bark (*Tetrahedron*

1985, 41, 4949); garuganin III isolated and its structure elucidated (*Phytochemistry* 1985, 24, 2463).

NEW COMPOUNDS



Garuganin I

R = H, R' = OMe

Garuganin III

R = OMe, R' = H

GELONIUM (Euphorbiaceae)

G. multiflorum Juss.; see *Suregada multiflora* (Juss.) Baill.

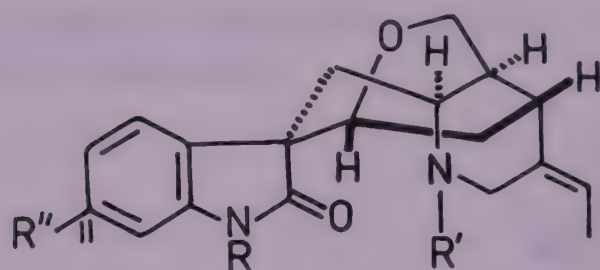
GELSEMIUM (Loganiaceae)

G. elegans (Gardn. & Champ.) Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 309).

Two alkaloids - humantenine and humantenirine - isolated from roots and their structures elucidated by X-ray analysis (*Yaoxue Xuebao* 1984, 19, 686; *Chem. Abstr.* 1985, 102, 21236 w; *J. Nat. Prod.* 1989, 52, 588); isolation of humantenidine from roots (*Yaoxue Xuebao* 1984, 19, 437; *Chem. Abstr.* 1985, 103, 3678 h); koumine isolated and identified (*Huaxue Xuebao* 1986, 44, 157; *Chem. Abstr.* 1986, 105, 172802 r); synthesis of koumine (*Youji Huaxue* 1986, 36; *Chem. Abstr.* 1986, 105, 97773 b; *Huaxue Xuebao* 1987, 45, 359; *Chem. Abstr.* 1988, 108, 22124 u); structure of koumidine revised to 19(Z)ethylidene configuration (*Phytochemistry* 1987, 26, 2875; *Chem. Pharm. Bull.* 1987, 35, 4668; *Tetrahedron* 1988, 44, 5075); three new alkaloids - 19(Z) akuammidine, 16-epivoacarpine and 19-hydroxydihydrogelsevirine - isolated from roots and their structures determined by X-ray analysis (*Chem. Pharm. Bull.* 1987, 35, 4668; *Tetrahedron* 1988, 44, 5075); in addition, new alkaloids - 19(Z)taberpsychine from roots and koumine N-oxide, gelsemine N-oxide and 19-oxygelsenicine from leaves, isolated

(*Tetrahedron* 1988, 44, 5075); isolation of a new monoterpenoid indole alkaloid - elegansamine - and its characterisation (*Tetrahedron Lett.* 1988, 29, 5395); a new oxindole alkaloid - gelsamydine - isolated from whole plant and its structure elucidated by X-ray analysis (*J. Org. Chem.* 1989, 54, 3199); isolation of four new alkaloids - N-desmethoxyrankinidine, 11-hydroxyrankinidine, 11-hydroxyhumantenine and 11-methoxyhumantenine - along with rankinidine and structure elucidation of new compounds; crystal structure of 11-hydroxyhumantenine determined (*J. Nat. Prod.* 1989, 52, 588); two new seco-indole alkaloids - gelsemamide and its 11-methoxy derivative - isolated and their structures established by X-ray studies (*Tetrahedron Lett.* 1989, 30, 1177).

NEW COMPOUNDS



N-Desmethoxyrankinidine

$R, R', R'' = H$

11-Hydroxyrankinidine

$R = OMe, R' = H, R'' = OH$

Humantenine

$R = OMe, R' = Me, R'' = H$

11-Hydroxyhumantenine

$R = OMe, R' = Me, R'' = OH$

Humantenirine

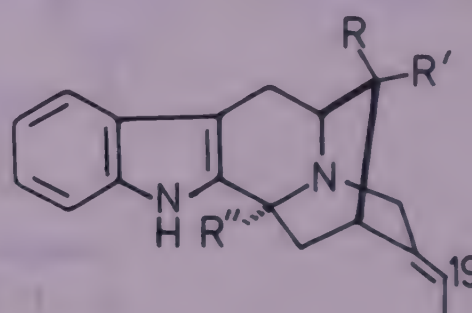
$R, R'' = OMe, R' = H$

11-Methoxyhumantenine

$R, R'' = OMe, R' = Me$

Rankinidine

$R = OMe, R', R'' = H$



19(Z)Koumidine

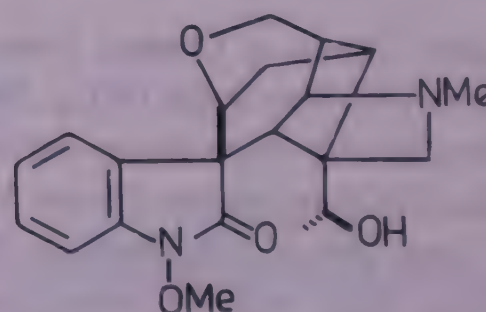
$R = CH_2OH, R', R'' = H$

19(Z)Akuammidine

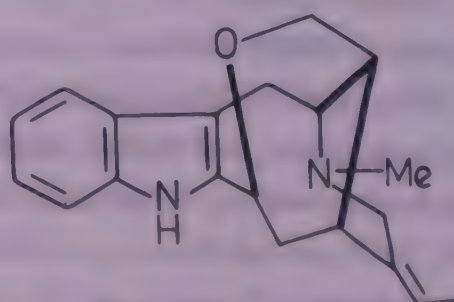
$R = COOMe, R' = CH_2OH, R'' = H$

19(E)16-Epivoacarpine

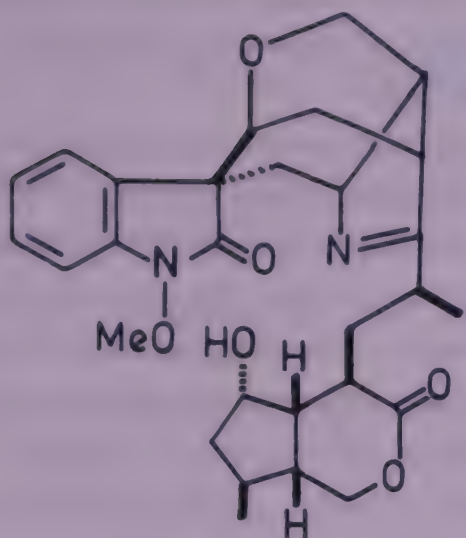
$R = CH_2OH, R' = COOMe, R'' = OH$



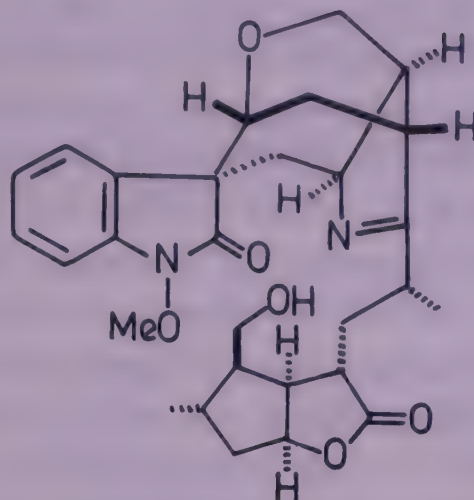
19-Hydroxydihydrogelsevirine



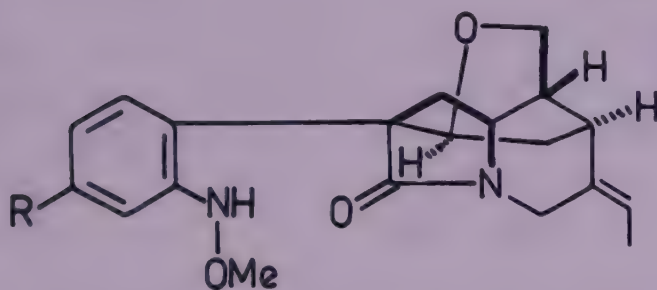
19(Z)Taberpsychine



Elegansamine



Gelsamydine

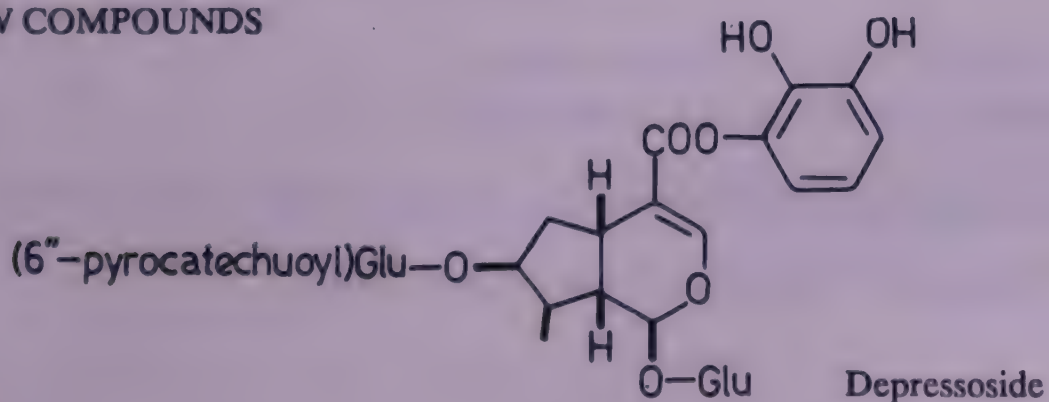


Gelsemamide

R = H

11-Methoxygelsemamide

R = OMe

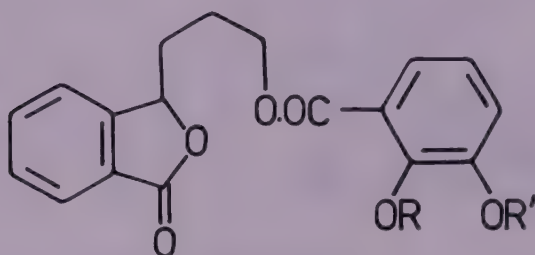
GENTIANA (Gentianaceae)*G. chirayita* Roxb. ex Flem.; see *Swertia chirayita* (Roxb. ex Flem.) Kars.*G. depressa* D.Don (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 338)A new iridoid alkaloid - depressoside - isolated from leaves and characterised (*J. Nat. Prod.* 1985, 48, 54).**NEW COMPOUNDS**

Depressoside

G. pedicellata (D.Don) Wall. ex Griseb. syn. *G. quadrifaria* sensu Clarke p.p., *G. quadrifaria* Clarke var. *pilosula* Clarke, *G. squarrosa* sensu Clarke p.p. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 310).

A new alkyl-3-phthalide - pedicelloside - isolated from leaves and characterised (*Tetrahedron* 1984, 25, 5039); isolation of isoorientin-6''-O-glucoside and isoorientin-3',6''-di-O-glucoside from leaves (*J. Nat. Prod.* 1985, 48, 480); a new phthalide glycoside - pedirutinoside - isolated from leaves and its structure determined (*J. Nat. Prod.* 1986, 49, 514); three new iridoids - 2'-p-coumaroylloganin, 2'-feruloylloganin and 2'-caffeoylloganin - from flowers and leaves along with loganin (*Planta Med.* 1986, 52, 327); isolation and characterisation of 4'-p-coumaroylloganic acid and 4'-p-coumaroylloganin; loganic acid also isolated (*Planta Med.* 1987, 53, 101); two new phthalides - pedicellosine and 6''-O-glucosylpedicelloside - isolated from leaves and characterised (*Planta Med.* 1987, 53, 297).

NEW COMPOUNDS



Pedicelloside

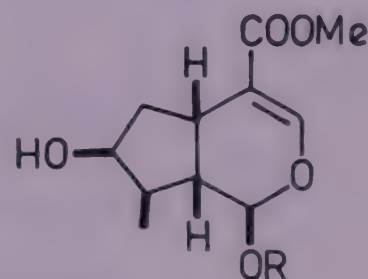
R = H, R' = Glu

Pedicellosine

R, R' = H

6''-O-Glucosylpedicelloside

R = H, R' = Gentiobiose



2'-p-Coumaroylloganin

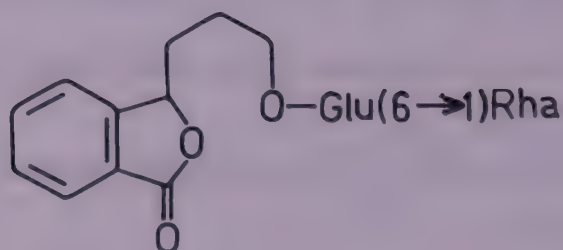
R = Glu(2'-p-coumaroyl)

2'-Feruloylloganin

R = Glu(2'-feruloyl)

2'-Caffeoylloganin

R = Glu(2'-caffeoyl)



Pedirutinoside

G. quadrifaria Clarke; see *G. pedicellata* (D.Don) Wall. ex Griseb.

G. quadrifaria Clarke var. *pilosula* Clarke; see *G. pedicellata* (D.Don) Wall. ex Griseb.

G. squarrosa Clarke; see *G. pedicellata* (D.Don) Wall. ex Griseb.

GERANIUM (Geraniaceae)

G. robertianum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 125).

Plant extract showed antiviral activity in monkey cell culture against vesicular stomatitis virus (*Ann. Pharm. Fr.* 1986, 44, 41; *Chem. Abstr.* 1986, 105, 108018 n).

G. sibiricum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 125).

Ethyl brevifolincarboxylate isolated along with scylloinositol, kaempferol, its 7 α -rhamnoside and 3,7 α -dirhamnoside, quercetin, protocathechuic acid, gallic acid, ellagic acid, brevifolin and corilagin (*Yaoxue Xuebao* 1987, 22, 28; *Chem. Abstr.* 1987, 106, 192739 z).

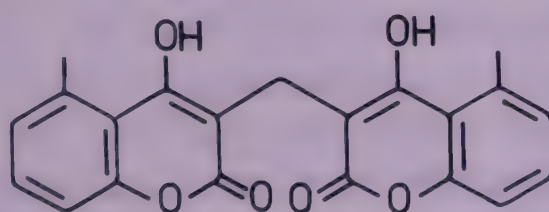
BIOLOGICAL ACTIVITY

Ethyl brevifolincarboxylate, kaempferol and its rhamnoside, quercetin, protocathechuic acid, gallic acid, ellagic acid, brevifolin and corilagin exhibited antibacterial activity; corilagin found to be most potent against *Staphylococcus aureus* (*Yaoxue Xuebao* 1987, 22, 28; *Chem. Abstr.* 1987, 106, 192739 z).

GERBERA (Asteraceae)

G. gossypina (Royle) Beauv. syn. *G. lanuginosa* (Wall. ex DC.) Benth. & Hook.f. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 341).

A new dimethyldicoumarol - gerberinol - isolated along with β -sitosterol- β -D-glucoside and characterised (*J. Indian Chem. Soc.* 1985, 62, 916).

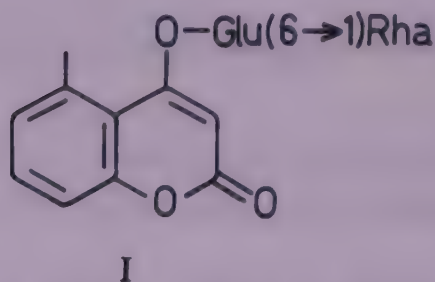
NEW COMPOUNDS

Gerberinol

G. jamesoni Bolus ex Gard. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 311).

A new 4-hydroxycoumarin glycoside - 5-methyl-4-rutinosyloxy-5-methylcoumarin (I) - isolated from roots along with prunasin, amygdalin, vicianin and 4- β -D-glucopyranosyloxy-5-methylcoumarin (*Chem. Pharm. Bull.* 1985, 33, 4803); aerial parts afforded friedelin, stigmasterol and benzoic acid (*Indian J. Nat. Prod.* 1988, 4(2), 14; *Chem. Abstr.* 1989, 110, 228633 j).

NEW COMPOUNDS



G. lanuginosa (Wall. ex DC.) Benth. & Hook.f.; see *G. gossypina* (Royle) Beauv.

GINKGO(Ginkgoaceae)

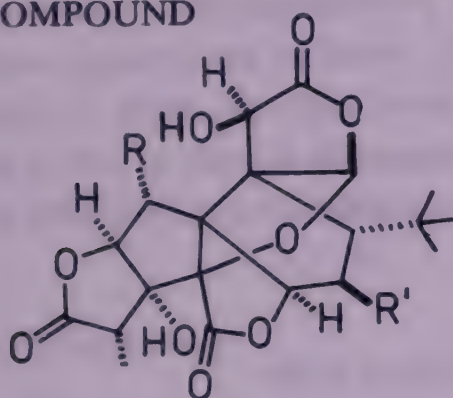
G. biloba L. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 311).

During a study on function and pathology of blood-brain barrier, plant extract at low concentration found to inhibit formation of prostacyclin by homogenate of beef brain microvessels. Therefore, extract is considered to have protective effect on blood-brain barrier (*Presse Med.* 1986, 15, 1498; *Chem. Abstr.* 1986, 105, 202968 u); perfusion with plant extract decreased arrhythmic and electrocardiogram dysfunctions in ischemic reperfused rat and guinea pig heart *in vitro* and in ischemic rat heart *in vivo* (*Presse Med.* 1986, 15, 1516; *Chem. Abstr.* 1986, 105, 202971 q); cerebral arteriolar vasospasm, induced by topical application of autologous serum to exposed brain surface of rabbits, was dose-dependently antagonised in both degree and duration by subsequent i.v. injection of extract (2.0-25.0 mg/kg). Oral pretreatment with extract (60.0 mg/kg/day) for 8-10 days, however, did not affect the time of induction of spasm or its intensity, but shortened its duration (*Presse Med.* 1986, 15, 1520; *Chem. Abstr.* 1986, 105, 202972 r); administration of extract (0.24 g/day for 2 months, orally) to healthy males did not affect endocrine system (*Presse Med.* 1986, 15, 1573; *Chem. Abstr.* 1986, 105, 203183 w); short-term memory was improved in normal women 1 hr after taking plant extract (0.6 g) (*Presse Med.* 1986, 15, 1592; *Chem. Abstr.* 1986, 105, 203117 e).

4-Methoxypyridoxine isolated from seeds and its structure determined (*Chem. Pharm. Bull.* 1985, 33, 3555; *ibid.* 1988, 36, 1779); a new flavonoid glycoside isolated from leaves and characterised as kaempferol-3-O- α -(6'''-p-coumaroylglucosyl-(1 \rightarrow 4) rhamnoside) (*Phytochemistry* 1986, 25, 770; *Planta Med.* 1988, 54, 245); isolation, crystal structure elucidation and synthesis of (Z,Z)4,4'-(1,4-pentadien-1,5-diyl)diphenol from leaves (*Ann. Chem.* 1986, 1772); total biflavones in leaves in spring, summer and autumn were 5.2, 4.4 and 18.1 mg/g respectively. Autumn leaves contained biflavones - sciadopitysin (10.2), ginkgetin (4.1), isoginkgetin (2.6) and bilobetin (1.1 mg/g) (*Linchan Huaxue Yu Gongye* 1986, 6, 42; *Chem. Abstr.* 1987, 106, 15784 q); anacardic acid, bilobol and cardanol isolated (*Chem. Pharm. Bull.* 1987, 35, 3016); conformations of ginkgolides A and C determined (*Acta Crystallogr., Cryst.*

Struct. Commun. 1987, 43C, 2377; *Chem. Abstr.* 1988, 109, 93359 f); a new ginkgolide - ginkgolide J - isolated from leaves and its structure elucidated (*Ann. Chem.* 1987, 521); isolation and structure elucidation of a flavone glycoside (I) from leaves (Eur. 237,066 (1987) Sep. 16; *Chem. Abstr.* 1988, 108, 19396 d); quercetin-3-O- α -(6'''-p-coumaroylglucosyl-(1 \rightarrow 4) rhamnoside) isolated from leaves and characterised (*Phytochemistry* 1987, 26, 2869); in addition isorhamnetol-3-O-rutinoside, kaempferol-3-O-rutinoside, -3-O- α -(6'''-p-coumaroylglucosyl (1 \rightarrow 4)rhamnoside), and -7-O-glucoside, syringetin-3-O-rutinoside, quercetol-3-O-rutinoside, -3-O-rhamnoside, -3-O-glucoside and -3-O- α -(6'''-p-coumaroylglucosyl (1 \rightarrow 4)rhamnoside) also isolated (*Planta Med.* 1988, 54, 245); isolation of ginkgolides B and C, sciadopitysin and bilobetin from leaves (*Shenyang Yaoxueyuan Xuebao* 1988, 5, 216; *Chem. Abstr.* 1989, 110, 128279 e); bilobetin, ginkgetin, isoginkgetin and sciadopitysin detected in leaves by HPLC (*J. Chromatogr.* 1988, 437, 453); isolation of amentoflavone from leaves (*Planta Med.* 1988, 54, 555); enantioselective total synthesis of bilobalide (*Tetrahedron Lett.* 1988, 29, 3423); a process developed to isolate ginkgo flavone glycosides in increased yield from leaves (*Saengyak Hakhoechi* 1989, 20, 43; *Chem. Abstr.* 1989, 111, 102599 e); quercetin-3-O-[α -rhamnosyl-(1 \rightarrow 2)- α -rhamnosyl(1 \rightarrow 6)]- β -glucoside and kaempferol-3-O-[α -rhamnosyl(1 \rightarrow 2)- α -rhamnosyl(1 \rightarrow 6)]- β -glucoside isolated from leaves (*Planta Med.* 1989, 55, 202).

NEW COMPOUND



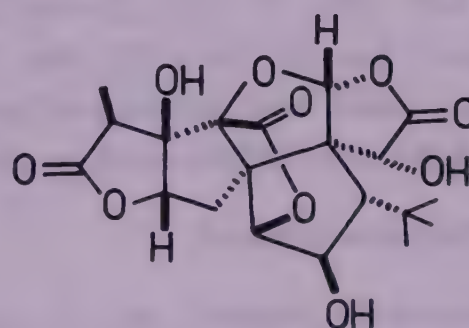
Ginkgolide A

 $R, R' = H$

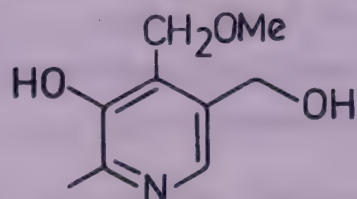
Ginkgolide B

 $R = H, R' = OH$

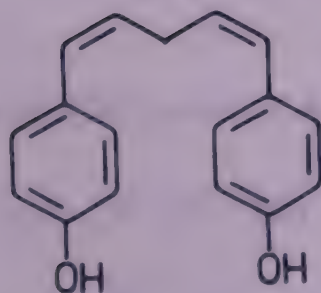
Ginkgolide C

 $R, R' = OH$ 

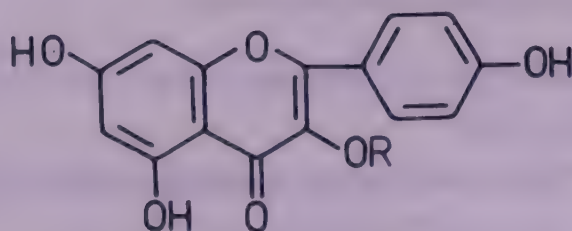
Ginkgolide J



4-Methoxypyridoxine



4,4'-(1,4-Pentadien-1,5-diyl)diphenol



I

 $R = \text{Rha}(2\rightarrow 1)\text{Gal}(6''\text{-p-coumaroyl})$

BIOLOGICAL ACTIVITY

Inhibition of antigen-induced lung anaphylaxis in guinea pig by ginkgolide B was studied. Its administration at 0.1-1.0 mg/kg, i.v., into passively sensitised animals, five min before challenge with ovalbumin injection, strongly or totally inhibited bronchoconstriction and partially reduced thrombocytopaenia and leukopaenia, indicating its use as a potent prophylactic anti-asthma drug (*Agents Actions* 1985, 17, 371; *Chem. Abstr.* 1986, 104, 161678 h); binding of 3H-labelled platelet-activating factor (PAF-acether) by membranes of rabbit platelets was inhibited by ginkgolide B. In electrically-stimulated rat carotid artery, ginkgolide B (20.0 mg/kg, orally) given 30 min before the challenge, increased thrombus formation time (*Adv. Pharmacol. Res. Pract., Proc. Congr. Hung. Pharmacol. Soc.*, 4th 1986, 3, 427; *Chem. Abstr.* 1987, 106, 188680 f); ginkgolide B provided concentration-dependent protection against dysrhythmias such as ventricular fibrillation, ventricular tachycardia and premature ventricular beats induced by ischemia (*Eur. J. Pharmacol.* 1989, 164, 293); ginkgolides B and C inhibited blood platelet aggregation (*Shenyang Yaoxueyuan Xuebao* 1988, 5, 216; *Chem. Abstr.* 1989, 110, 128279 e).

Anacardic acid, bilobol and cardanol showed antitumor activity against sarcoma 180 ascites in mice (*Chem. Pharm. Bull.* 1987, 35, 3016); 4-undecylcatechol exhibited strong antitumor activity against sarcoma 180 ascites and P-388 lymphocytic leukaemia (*Chem. Pharm. Bull.* 1989, 37, 1619); flavone glycoside (I) useful in ameliorating homokinetic disturbance (*Eur.* 237,066 (1987) Sep. 16; *Chem. Abstr.* 1988, 108, 19396 d); 4-methoxypyridoxine caused food poisoning by antagonising vitamin B6 in body as well as inhibiting formation of 4-aminobutyric acid from glutamate in brain (*Chem. Pharm. Bull.* 1988, 36, 1779).

GIVOTIA(Euphorbiaceae)

G. moluccana (L.) Sreemad. syn. *G. rottleriformis* Griff. ex Wight

Tel. - Tellapuliki, Ponaku; Tam. - Vendalai, Vandalei, Pundaralai, Vendarirbudali; Kan. - Bilitale, Bhutale, Pumki Pulkeer.

Betulinic acid, lupeol and betulin identified (*J. Indian Chem. Soc.* 1985, 62, 411).
Distribution : Peninsular India.

G. rottleriformis Griff. ex Wight; see *G. moluccana* (L.) Sreemad.

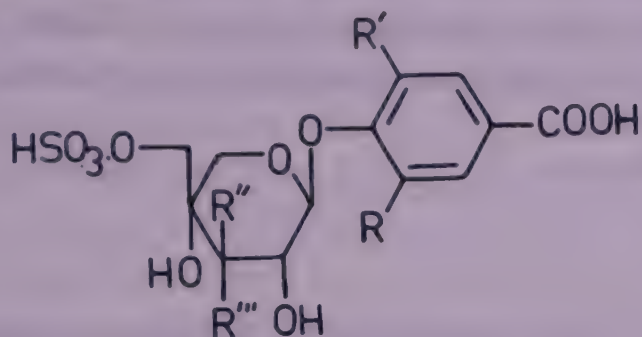
GLEDITSIA(Caesalpiniaceae)

G. triacanthos L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 312).

Plant shows strong nyctinastic behaviour (*Z. Naturforsch.* 1986, 41C, 547; *Chem. Abstr.* 1986, 105, 112007 a).

Five new turgor-influencing substances - PLMF1, PLMF3, PLMF4, PLMF5 and PLMF6 - isolated and their structures determined and confirmed by synthesis (*Z. Naturforsch.* 1986, 41C, 547; *Chem. Abstr.* 1986, 105, 112007 a); oleanolic acid identified as major component in leaves and fruits (*Rev. Chim.* 1987, 38, 171; *Chem. Abstr.* 1987, 107, 74283 u).

NEW COMPOUNDS



PLMF1

$R, R', R'' = OH, R''' = H$

PLMF3

$R', R''' = H, R, R'' = OH$

PLMF4

$R, R', R''' = H, R'' = OH$

PLMF5

$R, R''' = H, R' = OMe, R'' = OH$

PLMF6

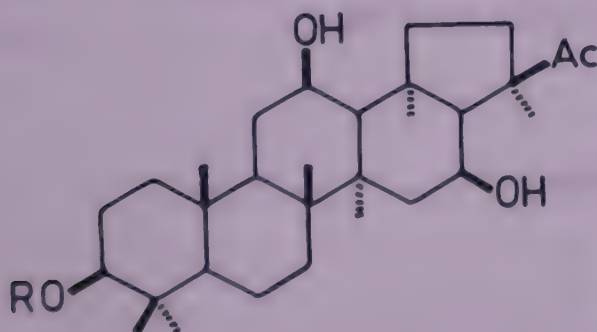
$R, R', R''' = OH, R'' = H$

GLINUS (Ficoidaceae)

G. oppositifolius (L.) A.DC. syn. *Mollugo oppositifolia* L., *M. spergula* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 313).

A new triterpene saponin - spergulacin - isolated and characterised (*Phytochemistry* 1986, 25, 1762); isolation of spergulacin A and its structure elucidation (*Phytochemistry* 1986, 25, 2577).

NEW COMPOUNDS



Spergulacin

$R = \text{Xyl}(3 \rightarrow 1)\text{Rha}$

Spergulacin A

$R = \text{Xyl}(2 \rightarrow 1)\text{Rha}$

GLIRICIDIA (Papilionaceae)

G. maculata (H.B. & K.) Steud.; see *G. sepium* (Jacq.) Kunth ex Walp.

G. sepium (Jacq.) Kunth ex Walp. syn. *G. maculata* (H.B. & K.) Steud. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 314).

Astragalin, trifolin, robinin and sucrose isolated from flowers (*J. Indian Chem. Soc.* 1985, 62, 171); isolation of pinitol (0.67%) from leaves (*Planta Med.* 1987, 53, 303).

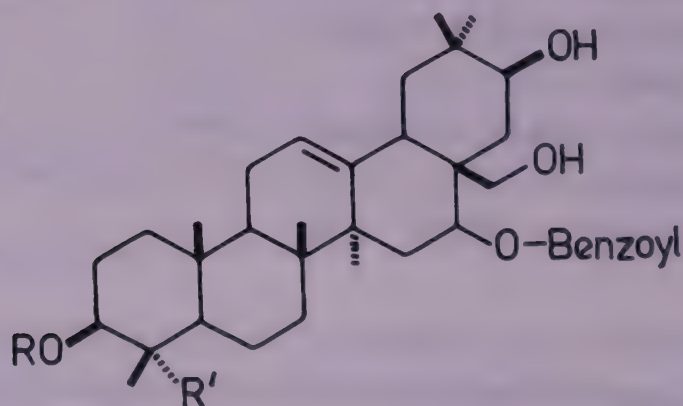
GLOCHIDION (Euphorbiaceae)

G. heyneanum Wight

Bhutan - Kotokmo shing.

A new triterpenoid glycoside - glochidioside - isolated and characterised (*Phytochemistry* 1986, 25, 2672); isolation and structure determination of glochidiosides N and Q; in addition glochidone, glochidonol, glochidiol, lup-20(29)-en-1 β ,3 β -diol, epimachaerinic acid, β -amyrin, stigmasterol, sitosterol- β -D-glucoside and mannitol isolated (*Phytochemistry* 1988, 27, 3575).

Distribution : Sikkim and Bhutan, alt. 150-1500 m.

NEW COMPOUNDS

Glochidioside

R = Ara(3 \rightarrow 1)Glu, R' = CH₂OH

Glochidioside N

R = Glu, R' = CH₂OH

Glochidioside Q

R = Glu(2 \rightarrow 1)Glu, R' = Me

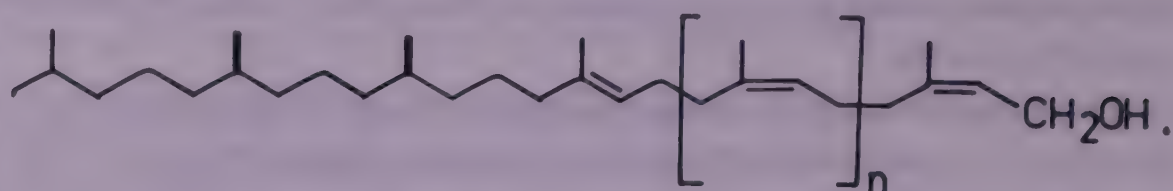
GLYCINE (Papilionaceae)

G. hispida Maxim.; see *G. max* (L.) Merr.

G. max (L.) Merr. syn. *G. soja* sensu Hook. f. (non Sieb. & Zucc.), *Soja hispida* Moench, *Glycine hispida* Maxim. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 315).

Daidzin, genistin, ononin, astragalin, isoquercitrin, rutin, kaempferol-3-O-rutinoside and quercetin-3-O-sophoroside isolated from aerial parts (*Khim. Pri. Soedin.* 1984, 659; *Chem. Abstr.* 1985, 102, 42887 z); a new C-glycosylflavone - 6,8-di-C-glucosyl/galactosyl genkwanin - isolated from roots along with carlinoside, isocarlinoside, vitexin, vitexin-2''-O-rhamnoside and isoschaftoside (*Phytochemistry* 1984, 23, 1153); soyasaponins I, II, III, A1 and A2 isolated from seeds (*Chem. Pharm. Bull.* 1985, 33, 598, 1069); structure of soyasaponin A1 shown to be 3-O-[β -D-glucopyranosyl(1 \rightarrow 2)- β -D-galactopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranosyl]soyasapogenol A (*Chem. Pharm. Bull.* 1985, 33, 1069); structure of soyasaponin A2 determined as 3-O-[β -D-galactopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranosyl]-22-O-[β -D-glucopyranosyl(1 \rightarrow 3)- α -L-arabinopyranosyl]soyasapogenol A (*Chem. Pharm. Bull.* 1985, 33, 598); detection of indole-3-acetylglutamate in seeds by GC-MS (*Plant Physiol.* 1986, 80, 256; *Chem. Abstr.* 1986, 104, 106276 a); gibberellins GA1 and GA2 isolated from immature seeds (*Biochem. Physiol. Pflanz.* 1986, 181, 265; *Chem. Abstr.* 1986, 104, 165391 g); coumesterol, phaseol and afrormosin isolated; molecular structure of afrormosin determined (*J. Nat. Prod.* 1986, 49, 1126); isolation of daidzin, glycitin, genistin, genistein and daidzein (*Jpn.* 62,126,186 (1987) Jun. 08; *Chem. Abstr.* 1988, 108, 210179 q); isolation of soyasaponin IV and its characterisation (*Phytochemistry* 1987, 26, 1214); crystal structure of soyasapogenol B1 determined as 3 β ,22 β ,24-trihydroxyolean-13(18)-ene by X-ray analysis (*J. Agric. Food Chem.* 1987, 35, 971; *Chem. Abstr.* 1987, 107, 214824 y); soyasaponin A3 isolated from seeds and characterised (*J. Nat. Prod.* 1988, 51, 122); soyasaponins I, II and III characterised as 3-O-[α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-galactopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranosyl]-soyasapogenol B, 3-O-[α -L-rhamnopyranosyl(1 \rightarrow 2)- α -L-arabinopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranosyl]-soyasapogenol B and 3-O-[β -D-galactopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranosyl]-soyasapogenol B respectively (*Chem. Pharm. Bull.* 1988, 36, 153); three new partially acetylated soyasaponins - acetyl-soyasaponins A1, A2 and A3 - isolated from seeds of American plant (*Chem. Pharm. Bull.* 1988, 36, 2819); two series of homologues of polyprenols - glycinoprenol-9, -10 and -11 and ficaprenol-10, -11 and -12 isolated from leaves; glycinoprenols found to possess a phytol residue, four to six internal (Z)prenyl residues and a (Z) α -terminal residue (*J. Org. Chem.* 1989, 54, 3390).

NEW COMPOUNDS



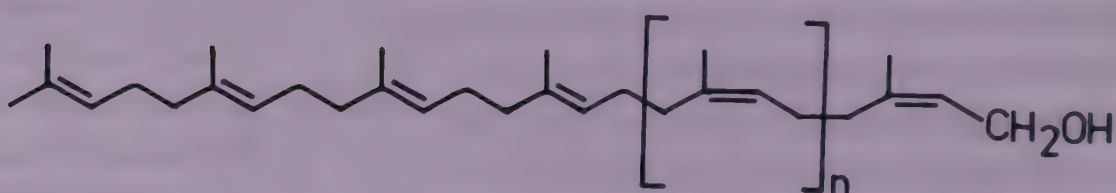
Glycinoprenol-9

 $n = 4$

Glycinoprenol-10

 $n = 5$

Glycinoprenol-11

 $n = 6$ 

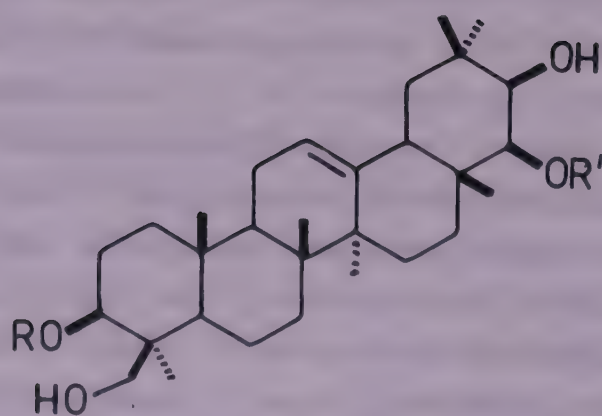
Ficaprenol-10

 $n = 5$

Ficaprenol-11

 $n = 6$

Ficaprenol-12

 $n = 7$ 

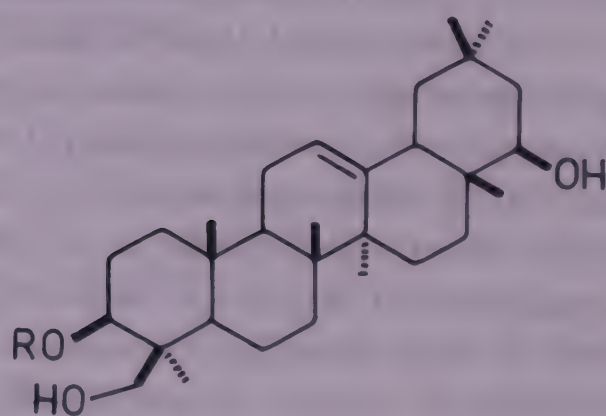
Soyasaponin A1

 $R = \text{Gluc.acid}(2 \rightarrow 1)\text{Gal}(2 \rightarrow 1)\text{Glu},$ $R' = \text{Ara}(3 \rightarrow 1)\text{Glu}$

Soyasaponin A2

 $R = \text{Gluc.acid}(2 \rightarrow 1)\text{Gal}$ $R' = \text{Ara}(3 \rightarrow 1)\text{Glu}$

Soyasaponin A3

 $R = \text{Gluc. acid}(2 \rightarrow 1)\text{Gal}(2 \rightarrow 1)\text{Rha}, R' = \text{H}$ 

Soyasaponin IV

 $R = \text{Gluc.acid}(2 \rightarrow 1)\text{Ara}$

G. soja Sieb. & Zucc.; see *G. max* (L.) Merr.

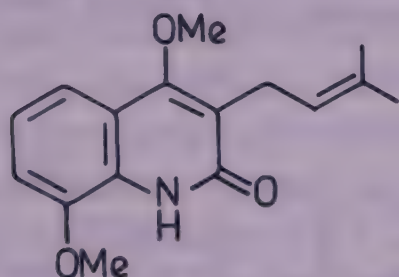
GLYCOSMIS (Rutaceae)

G. arborea (Roxb.) DC.; see *G. pentaphylla* (Retz.) DC.

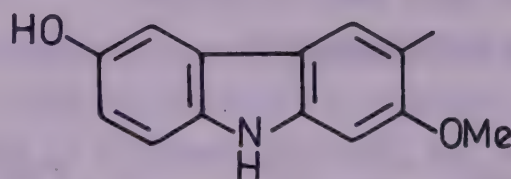
G. pentaphylla (Retz.) DC. syn. *G. arborea* (Roxb.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 318).

A quinolone alkaloid - glycolone - isolated from leaves and characterised as 4,8-dimethoxy-3-(3-methylbut-2-enyl)-2(1H)-quinolinone (*Phytochemistry* 1985, 24, 634); isolation of a new carbazole alkaloid - glycozolidol - from roots and its characterisation (*Phytochemistry* 1985, 24, 882); homoglycosolone isolated from root bark and its structure established (*Chem. Ind.* 1986, 669); a new 2-quinolone alkaloid isolated and characterised as 3-(but-2'-enyl)-4-ethoxy-8-hydroxy-1-methylquinolin-2(1H)-one (I, also named as glycolone) (*Indian J. Chem.* 1988, 27B, 460); a carbazole alkaloid - mupamine - isolated and its structure determined and confirmed by partial synthesis (*Phytochemistry* 1989, 28, 677).

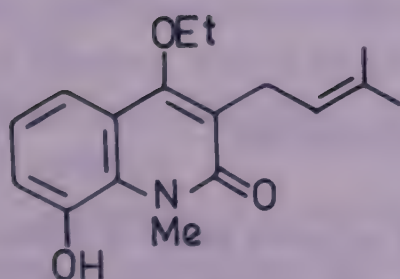
NEW COMPOUNDS



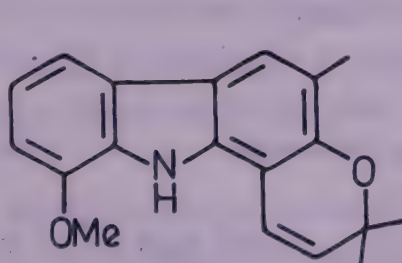
Glycolone



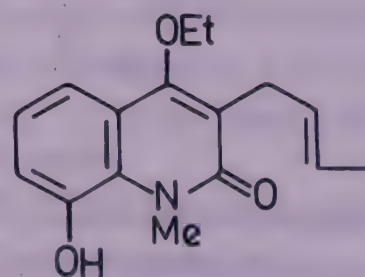
Glycozolidol



Homoglycosolone



Mupamine



I

BIOLOGICAL ACTIVITY

Glycozolidol exhibited antibacterial activity against Gram-positive and Gram-negative bacteria (*Phytochemistry* 1985, 24, 882).

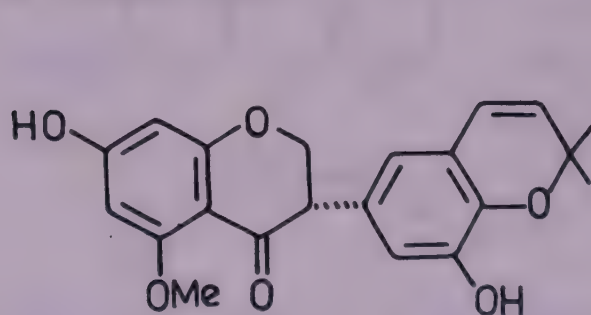
Note : Trivial name glycolone given to two different substances.

GLYCYRRHIZA (Papilionaceae)

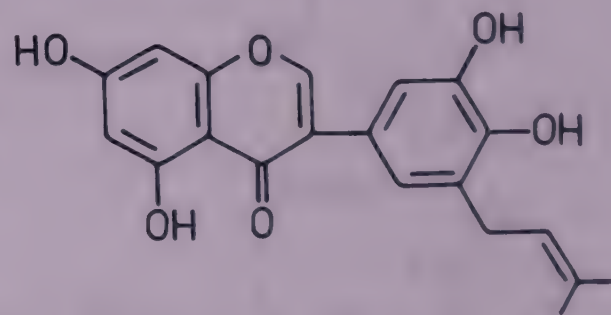
G. glabra L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 319).

Aqueous extract effective in conjunctivitis, specially in its acute condition; it also showed anti-inflammatory activity like cortisone (*J. Res. Ayurveda & Siddha* 1988, 1, 21).

Liquiritigenin-4'-apiosyl(1→2)glucoside and liquiritigenin-7,4'-diglucoside isolated along with apigenin-6,8-di-C-glucoside (*Phytochemistry* 1984, 23, 2108); galangin, naringenin, genistein, 5,7-dihydroxy-6-(γ,γ -dimethylallyl)flavanone, pinocembrin and glabranin obtained from aerial parts (*Khim. Prir. Soedin.* 1986, 111; *Chem. Abstr.* 1986, 104, 203930 s); determination of hexanoic acid (31.57), γ -nonalactone (1.33), cumic alcohol (0.79), indole (0.25), anethole (0.23), eugenol (0.21) and estragole (0.18%) in root essential oil by GC-MS (*Nippon Nogei Kagaku Kaishi* 1987, 61, 1119; *Chem. Abstr.* 1988, 108, 62302 g); glycyrrhisoflavanone and glycyrrhisoflavone isolated from roots and characterised; licochalcone B also isolated (*Chem. Pharm. Bull.* 1988, 36, 2090); licuroside, previously isolated from roots, has now been shown to be a mixture of isomers, neolicuroside (isoliquiritigenin-4 β -apiofuranosyl-2''- β -glucoside) and isoliquiritigenin-4'- β -apiofuranosyl-2''- β -glucoside (*Arch. Pharm.* 1989, 322, 141; *Chem. Abstr.* 1989, 111, 4253 t).

NEW COMPOUNDS

Glycyrrhisoflavanone



Glycyrrhisoflavone

BIOLOGICAL ACTIVITY

Glycyrrhizin injected (75.0 or 150.0 mg/kg, i.p.) in mice increased weight of spleen and thymus; white blood cell count and clearance rate of charcoal particles injected i.v. also increased. Administration of glycyrrhizin to mice prior to treatment with carbon tetrachloride inhibited increase in levels of serum and liver transaminase, indicating that glycyrrhizin has immunostimulant as well as hepatoprotective properties (*Yaoxue Xuebao* 1984, 19, 926; *Chem. Abstr.* 1985, 103, 31981 v); glycyrrhizin and glycyrrhetic acid showed antihepatotoxic activity against carbon tetrachloride and galactosamine-induced cytotoxicity in primary cultured rat hepatocytes; inhibitory activity may be related to their antioxidant activity (*Planta Med.* 1984, 50, 298); glycyrrhizin, a depolarising neuromuscular blocker, decreased intracellular Ca^{2+} -aequorin luminescence, in directly stimulated diaphragm muscles of mouse. Caffeine-induced

increase in Ca^{2+} -aequorin luminescence was inhibited by glycyrrhizin (*Jap. J. Pharmacol.* 1985, 39, 387); antiviral action of glycyrrhizin on Varicella-zoster virus (VZV) studied *in vitro*; ID50 was found to be 0.71 mM when human embryonic fibroblast (HEF) cells were treated with glycyrrhizin after inoculation of virus. It was also effective against VZV replication when HEF cells were treated 24 hr before inoculation. At 2.4 mM, it inactivated more than 99% of virus particles within 30 min (*Antiviral Res.* 1987, 7, 99; *Chem. Abstr.* 1987, 106, 131309 n); glycyrrhizin at 0.2% concentration markedly increased proliferation of human fibroblasts *in vitro*; however, it decreased viability of fibroblasts at 10% (*Yakuri to Chiryō* 1988, 16, 35; *Chem. Abstr.* 1988, 108, 216001 x); glycyrrhizin (25.0 or 50.0 mg/kg, i.v.) inhibited passive cutaneous anaphylaxis response in mice. Glycyrrhizin inhibited concentration-dependently contraction of rabbit ileum and guinea pig trachea induced by histamine or acetylcholine *in vitro* (*Zhongguo Yaoli Xuebao* 1986, 7, 175; *Chem. Abstr.* 1986, 104, 199763 v); glycyrrhizin given i.p., inhibited granuloma formation induced by intradermal injection of silica in guinea pig (*Yakuri to Chiryō* 1989, 17, 3749; *Chem. Abstr.* 1989, 111, 208849 b); glycyrrhizin (0.1-10.0 $\mu\text{g/ml}$) when added to culture medium significantly suppressed production of platelet-activating factor from rat peritoneal exudate cells stimulated by calcium ionophore A23187. Part of antiallergic action of glycyrrhizin might be due to its inhibitory effect on PAF production (*Arenugi* 1989, 38, 365; *Chem. Abstr.* 1989, 111, 126708 r).

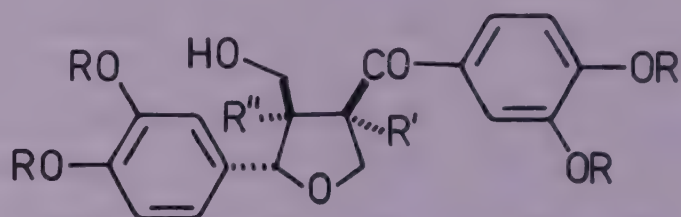
Glycyrrhetic acid and glycyrrhetinic acid inhibited tumor-promoting activity both 12-O-tetradecanoylphorbol-12-acetate and teleocidin on skin tumor initiated in mice with 7,12-dimethylbenz[a]anthracene (*Jap. J. Cancer Res.* 1986, 77, 33; *Chem. Abstr.* 1986, 104, 141860 h; *Kyoto- Furitsu Ika Daigaku Zasshi* 1986, 95, 1563; *Chem. Abstr.* 1987, 106, 149002 s); glycyrrhetinic acid (50.0 and 100.0 mg/kg/day, i.p. for 7 days) increased subtraction potential difference between rectal and oral mucosa in adrenalectomised rats as compared with control rats. However, dose of glycyrrhetinic acid necessary for mineralocorticoid action was very high as compared to that of aldosterone (*Igaku no Ayumi* 1988, 144, 755; *Chem. Abstr.* 1988, 108, 198016 z).

Licochalcone B showed highest binding activity to haemoglobin and also showed highest activity as radical scavenger as compared to glycyrrhisoflavone and glycyrrhisoflavanone (*Chem. Pharm. Bull.* 1988, 36, 2090); isoliquiritigenin inhibited *in vitro* aldose reductase in rat lens. It also inhibited sorbitol accumulation in human erythrocytes concentration-dependently (*Wakan Iyaku Gakkaishi* 1988, 5, 514; *Chem. Abstr.* 1989, 111, 70758 n); gliderinin showed pronounced antiinflammatory activity in mice and rats more than that of hydrocortisone or amidopyrine. It also possessed analgesic, antipyretic and antiallergic properties but failed to suppress hemopoiesis; it showed low toxicity (*Farmakol. Toksikol.* 1988, 51, 90; *Chem. Abstr.* 1988, 109, 104381 k).

GMELINA (Verbenaceae)

G. arborea Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 320).

A new coumarin glycoside - apiosylskimmin - isolated from roots and characterised as umbelliferone-7-apiosyl(1→6)glucoside (*Phytochemistry* 1985, 24, 1862); isolation of two new ketolignans - arborone and 7-oxodihydrogmelinol - from heartwood together with paulownin acetate, epieudesmin, methyl trans-p-methoxycinnamate and trans-p-hydroxycinnamic acid (*J. Nat. Prod.* 1986, 49, 1061).

NEW COMPOUNDS

Arborone

$R R = -CH_2-$, $R' = OH$, $R'' = H$

7-Oxodihydrogmelinol

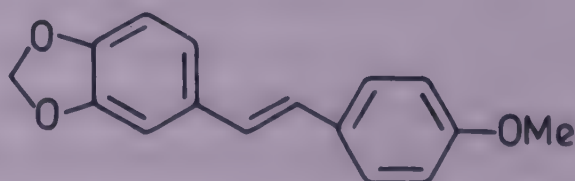
$R = Me$, $R' = H$, $R'' = OH$

GNETUM (Gnetaceae)

G. scandens Roxb. see *G. ula* Brongn.

G. ula Brongn. syn. *G. scandens* sensu Hook.f. p.p. (non 'Roxb.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 321).

A new compound - gnetin - isolated and characterised as 3,4-methylenedioxy-4'-methoxy-trans-stilbene; structure of another compound, earlier designated as 3,4,3'-trihydroxy-2-methoxy-trans-stilbene, revised to 3,4,5'-trihydroxy-3'-methoxy-trans-stilbene (*Phytochemistry* 1985, 24, 622); seed oil contained sterculic (28.57) and malvalic (11.27%) acids (*J. Am. Oil Chem. Soc.* 1986, 63, 1191; *Chem. Abstr.* 1986, 105, 206282 p).

NEW COMPOUNDS

Gnetin

GONIOGYNA (Papilionaceae)

G. hirta (Willd.) Ali syn. *Heylandia latebrosa* DC. [non *Hedysarum latebrosum* L.] (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 322).

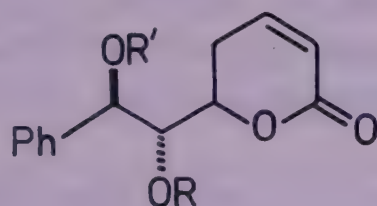
Vitexin and an uncharacterised triterpenoid saponin isolated from leaves (*Indian J. Pharm. Sci.* 1984, 46, 203).

GONIOTHALAMUS (Annonaceae)

G. griffithii Hook.f. & Thoms.

Three new pyrones - 6-(7,8-dihydro-7-acetoxy-8-hydroxystyryl)-5,6-dihydro-2-pyrone (I), 6-(7,8-dihydro-7,8-dihydroxystyryl)-5,6-dihydro-2-pyrone (II) and 6-(7,8-dihydro-7,8-diacetoxystyryl)-5,6-dihydro-2-pyrone (III) isolated from bark and characterised (*Indian J. Chem.* 1985, 24B, 29); isolation of pinocembrin from bark and its biomimetic synthesis (*Indian J. Chem.* 1985, 24B, 561).

Distribution : Andaman Islands.

NEW COMPOUNDS

I

R = Ac, R' = H

II

R, R' = H

III

R, R' = Ac

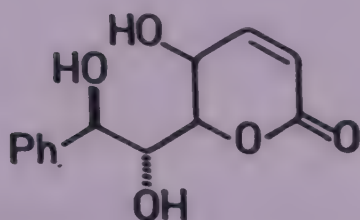
G. sesquipedalis (Wall.) Hook.f. & Thoms.

Khasi - Som-um-synrang; Lepcha - Singnyok-kung; Lushai - Kham; Manipur - Leikham; Nep. - Sane.

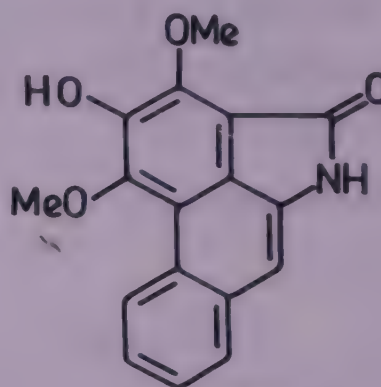
A new 5,6-dihydro-2-pyrone - 6-(7,8-dihydro-7,8-dihydroxystyryl)-5,6-dihydro-5-hydroxy-2-pyrone (I) isolated from leaves and twigs along with 6-(7,8-dihydro-7-acetoxy-8-hydroxystyryl)-5,6-dihydro-2-pyrone; 6-(7,8-dihydro-7,8-dihydroxystyryl)-5,6-dihydro-2-pyrone and 6-(7,8-dihydro-7,8-diacetoxystyryl)-5,6-dihydro-2-pyrone and characterised (*Indian J. Chem.* 1985, 24B, 29); goniopedaline isolated from leaves and twigs and characterised as 10-amino-3-hydroxy-2,4-dimethoxyphenanthrene-1-carboxylic acid lactam; aristololactam A-II and its N,O-diacetyl derivative, taliscanine, aurantiamide acetate, β -sitosterol and its glucoside also isolated (*Phytochemistry* 1988, 27, 903).

Distribution : Sikkim, Assam and Meghalaya, alt. 500-1500 m.

NEW COMPOUNDS



I



Goniopedaline

GOSSYPIUM (Malvaceae)

G. arboreum L. emend. Hutch. et al. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 127).

Gossypetin-8-O-rhamnoside along with quercetin-3-O-glucoside, -7-O-glucoside and -3'-O-glucoside isolated from flower petals (*Phytochemistry* 1984, 23, 2509); (-)gossypol isolated from seeds (*Contraception* 1988, 37, 239; *Chem. Abstr.* 1988, 109, 20296 y).

BIOLOGICAL ACTIVITY

Gossypetin-8-O-rhamnoside and 3-, 7- and 3'-O-glucoside of quercetin showed anti-bacterial activity against *Pseudomonas maltophilia* and *Enterobacter cloacae* (*Phytochemistry* 1984, 23, 2509).

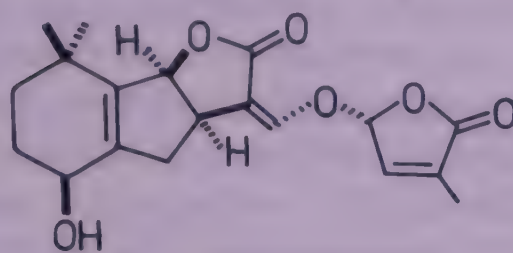
G. barbadense L. emend. Hutch. et al. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 322).

(-)Gossypol isolated from seeds (*Kexue Tongbao* 1988, 33, 172; *Chem. Abstr.* 1988, 108, 201727 q; *Contraception* 1988, 37, 239; *Chem. Abstr.* 1988, 109, 20296 y).

G. hirsutum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 322).

(+)Strigol isolated and its absolute structure determined (*J. Am. Chem. Soc.* 1972, 94, 6198; *J. Org. Chem.* 1985, 50, 3779); synthesis of abscisic acid (*Saengyak Hakhoechi* 1986, 17, 67; *Chem. Abstr.* 1987, 106, 120089 q); isolation of (-)gossypol from seeds (*Contraception* 1986, 37, 239; *Chem. Abstr.* 1988, 109, 20296 y).

NEW COMPOUNDS



(+)Strigol

BIOLOGICAL ACTIVITY

Gossypol (25.0-100.0 $\mu\text{g}/\text{mouse}/\text{day}$, i.p.) prolonged survival time of Ehrlich ascites tumor bearing mice. However, at high dose, gossypol caused loss of body weight and mortality (*Cancer Lett.* 1984, 24, 257; *Chem. Abstr.* 1985, 102, 55780 j); gossypol (5.0 μM) decreased percentage of Oc3-Ham and Ovar-3 human ovarian carcinoma cells by 90%. Its antitumor effect was 3-7 fold greater than that of tamoxifen, adriamycin or fluorouracil (*Jinan Liyi Xuebao* 1987, 39; *Chem. Abstr.* 1988, 108, 31439 c); gossypol (0.5 μM), *in vitro* reduced growth rate of cultures of human SW-13 cells. Pretreatment of nude mice, transplanted with SW-13 cells, with gossypol (30.0 $\text{mg}/\text{kg}/\text{day}$, oral) for 7 days delayed onset of visible tumors in subsequent weeks (*Cancer Res.* 1989, 49, 3754; *Chem. Abstr.* 1989, 111, 70498 c).

Oral administration of gossypol at 20.0 - 40.0 mg/kg daily for 8 weeks, did not produced any significant change in differential and total leucocyte count and haemoglobin in rats (*Indian J. Med. Res.* 1986, 83, 351); gossypol produced marked negative inotropic and arrhythmogenic effects in guinea pig heart muscle. It (0.5-5.0 μM) caused significant decrease in positive inotropic effect of extracellular Ca^{2+} . Action of gossypol on cardiac muscle is not specific to utilisation of either superficial or intracellular Ca^{2+} pools involved in contractile activation (*Eur. J. Pharmacol.* 1987, 143, 9); gossypol (2.0 $\mu\text{g}/\text{ml}$) markedly inhibited contractile responses of guinea pig lung parenchyma strips stimulated with leukotriene B₄, leukotriene D₄ or PAF-acether but not the responses to histamine, suggesting that inhibition of myotropic activity of lung parenchyma was due to interference with formation of cyclooxygenase products in guinea pig lung (*J. Pharm. Pharmacol.* 1987, 39, 454); gossypol at 30.0 and 40.0 $\text{mg}/\text{kg}/\text{day}$ for eight weeks caused necrotic change in seminiferous tubules in 75 and 93% of male rats and degenerative changes in epithelial lining in 58 and 71% of rats respectively and degenerative changes in epithelial lining (*Indian J. Med. Res.* 1988, 87, 368).

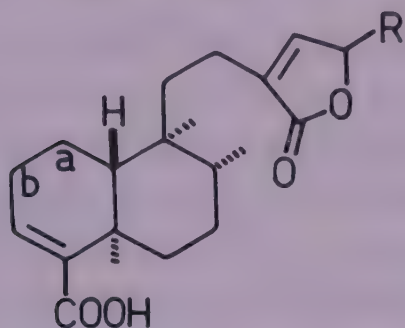
GRANGEA (Asteraceae)

G. maderaspatana (L.) Poir. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 323).

Chloroform extract exhibited strong cytotoxic activity (*J. Nat. Prod.* 1989, 52, 130).

Eight new clerodane derivatives - 2 α -acetoxyhardwickiic acid, 16-oxo-15,16H-hardwickiic acid and its 15-methoxyderivative, norhardwickiic acid, 10-epinidoresedic acid, 15-methoxy-16-oxonidoresedic acid, norstrictic acid and 15-methoxy-16-oxo-15,16H-strictic acid - isolated from aerial parts along with phytol, lupeol, p-hydroxybenzoic acid, hardwickiic acid and strictic acid; structures of new compounds elucidated (*Phytochemistry* 1988, 27, 1537); isolation of a new eudesmanolide - (+)grangolide - along with (-)frullanolide and (-)7 α -hydroxyfrullanolide and its characterisation (*J. Nat. Prod.* 1989, 52, 130).

NEW COMPOUNDS



16-Oxo-15,16H-hardwickiic acid

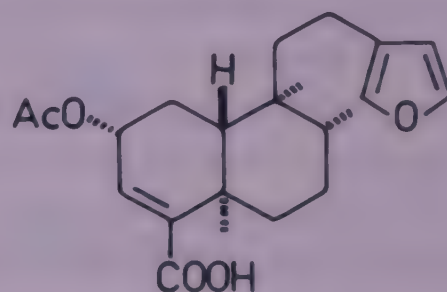
R = H

15-Methoxy-16-oxo-15,16H-hardwickiic acid

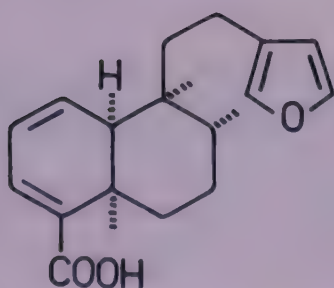
R = OMe

15-Methoxy-16-oxonidoresedic acid

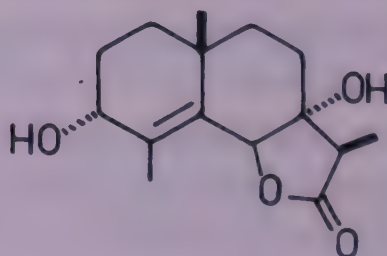
R = OMe, ab = Δ



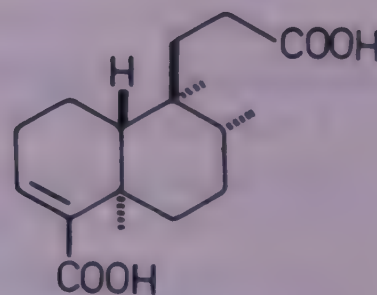
2 α -Acetoxyhardwickiic acid



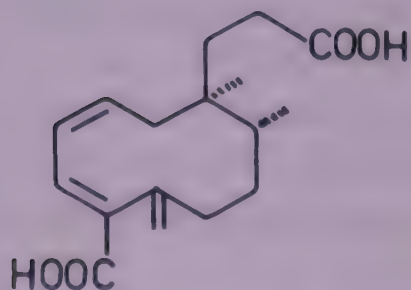
10-Epinidoresedic acid



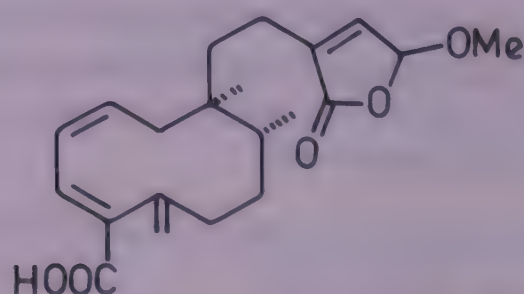
(+)Grangolide



Norhardwickiic acid



Norstrictic acid



15-Methoxy-16-oxo-15,16H-strictic acid

GREWIA (Tiliaceae)

G. asiatica L.; see *G. subinaequalis* DC.

G. subinaequalis DC. syn. *G. asiatica* sensu Hook.f. p.p. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 324).

Oil content in seed coat (2.0) and in kernel (23.7%); oil-free kernels contained 34.9% protein; linoleic acid (51.7%) is major component of oil with lesser amounts of arachidic, heptadecanoic, linolenic, myristic, oleic, palmitic, palmitoleic and stearic acids (*J. Oil Technol. Assoc. India* 1987, 19, 23; *Chem. Abstr.* 1988, 109, 187385 p).

G. villosa Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 324).

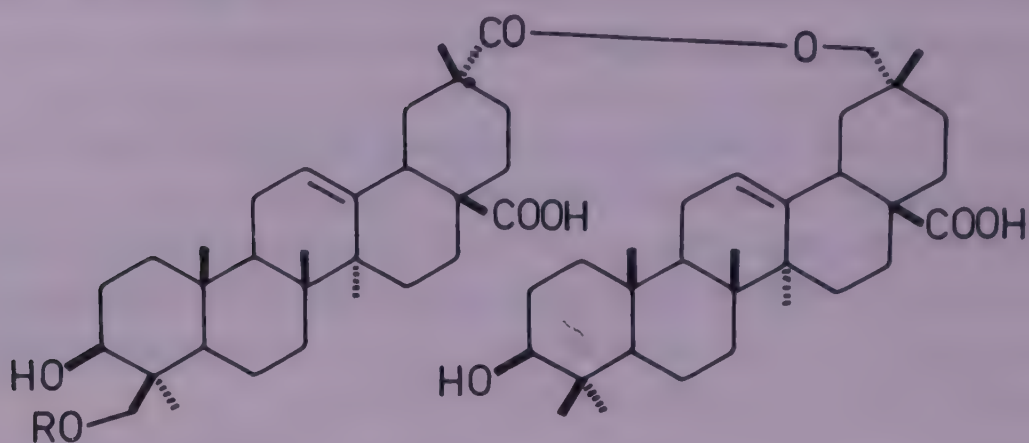
Harman, harmine, harmol, harmalol, harmaline, sucrose, glucose and galactose isolated from roots (*Fitoterapia* 1987, 58, 141).

GUAIAECUM (Zygophyllaceae)

G. officinale L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 355).

A new sapogenin - officigenin - isolated from acid hydrolysate and characterised (*J. Nat. Prod.* 1984, 47, 977); a prosapogenin, 24-O- β -D-glucopyranosylofficigenin also isolated (*J. Nat. Prod.* 1985, 48, 826); isolation of a new nortriterpenoid saponin - guaianin - from stem bark and its structure elucidation (*J. Nat. Prod.* 1986, 49, 784); guaianin on acid hydrolysis yielded 3 β ,20-dihydroxy-30-norolean-12-en-28-oic acid, its artefacts - 3 β -hydroxy-30-norolean-12,19-dien-28-oic acid and its methyl ester; larreagenin, sitosterol and oleanolic acid also isolated from stem bark (*Phytochemistry* 1984, 23, 2613); another artefact, 3 β -hydroxy-20-methoxy-30-norolean-12-en-28-oic acid isolated from acid hydrolysate of guaianin (*J. Chem. Soc. Pak.* 1985, 7, 137); a new saponin isolated from stem bark along with sitosterol-D-glucoside and characterised as 3-O-[α -L-arabinopyranosyl]-30-norolean-12,20(29)-dien-28-oic acid (I) (*Phytochemistry* 1986, 25, 951); three new saponins - guaianins A, A1 and B - isolated from stem bark and their structures elucidated (*Gazz. Chim. Ital.* 1989, 119, 31; *Chem. Abstr.* 1989, 111, 74774 n); isolation and characterisation of guaianin D and guaianin E from stem bark (*Tetrahedron* 1988, 44, 247).

NEW COMPOUNDS

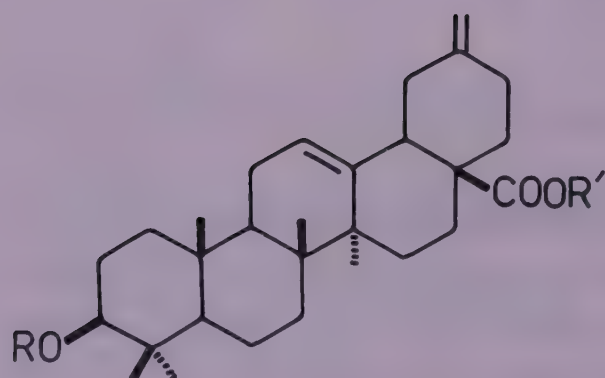


Officigenin

R = H

Officigenin-24-O-glucoside

R = Glu



I

R = Ara, R' = H

Guaianin A

R = Ara(2→1)Rha, R' = H

Guaianin

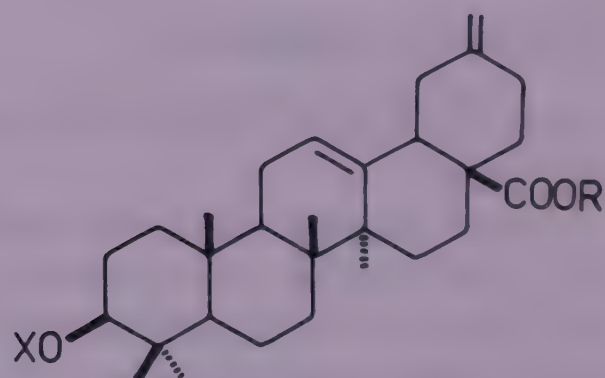
R = Ara(3→1)Glu(3→1)Rha, R' = H

Guaianin A1

R = Ara(3→1)Rha, R' = H

Guaianin B

R = Ara(3→1)Glu(3→1)Rha, R' = Glu



X = Ara[(2→1)Rha(3→1)Rha](→1)Glu

Guaianin D

R = H

Guaianin E

R = Glu

GYMNEMA (Asclepiadaceae)

G. alterniflorum (Lour.) Merr. (*alternifolium*)

Two new triterpenoids - cycloartenyl cinnamate and D-friedoolean-11 α ,12 α -epoxy-14-en-3 β -yl cinnamate - isolated from fruits together with 24-methylenecycloartanyl cinnamate,

acetate and cinnamate of β -amyrin and methyl- α -D-galactopyranoside (*Proc. Natl. Sci. Counc. Repub. China* 1987, 11A, 203; *Chem. Abstr.* 1988, 108, 19189 p).

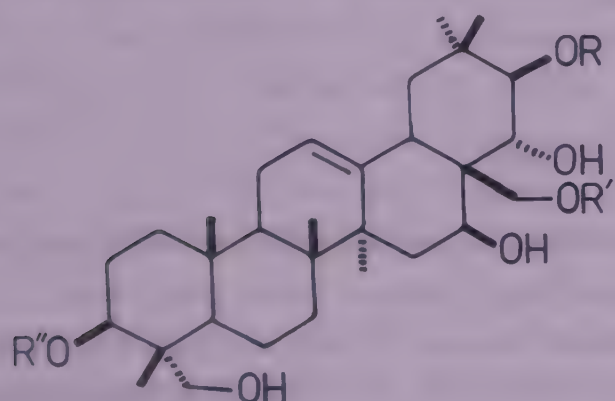
Distribution : Tamil Nadu.

G. sylvestre (Retz.) Schult. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 325).

Leaf extract showed hypoglycaemic activity in humans (33 to 70 years); no toxic effect observed on liver, kidney and haemopoietic system (*Arogya* 1988, 14, 62).

Gymnemic acids I, II, III and IV isolated from leaves and their structures elucidated (*Tetrahedron Lett.* 1989, 30, 1103, 1547); isolation of gymnemic acids V, VI and VII from leaves and their characterisation; gypenosides II, V, XLIII, XLV, XLVII and LXXIV as well as gynosaponin TN-2 also isolated (*Chem. Pharm. Bull.* 1989, 37, 852).

NEW COMPOUNDS



Gymnemic acid I

R = Tigloyl, R' = Acetyl, R'' = Gluc.acid

Gymnemic acid II

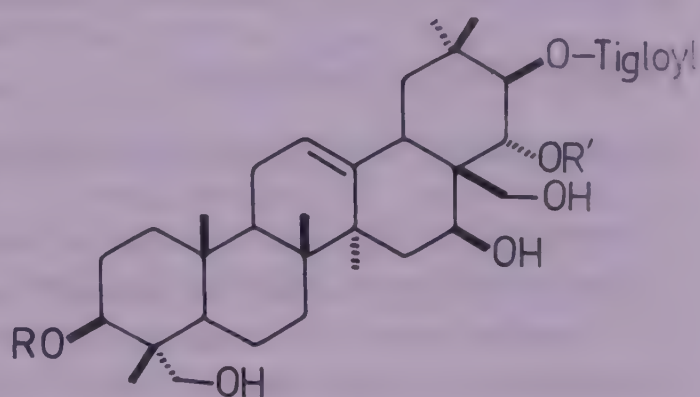
R = 2-Methylbutyryl, R' = Acetyl, R'' = Gluc.acid

Gymnemic acid III

R = 2-Methylbutyryl, R' = H, R'' = Gluc.acid

Gymnemic acid IV

R = Tigloyl, R' = H, R'' = Gluc.acid

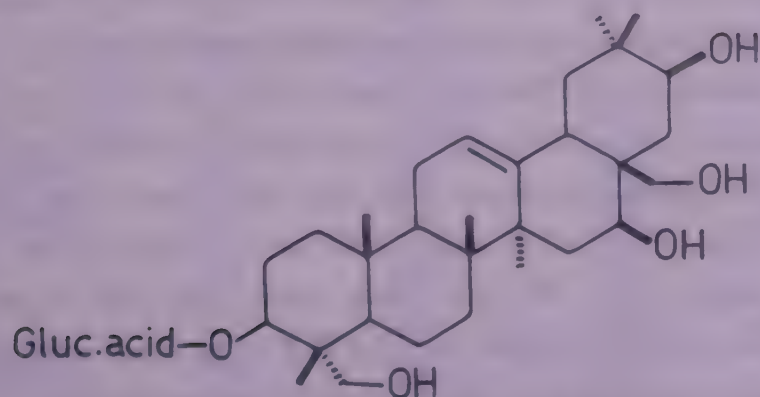


Gymnemic acid V

R = Gluc.acid, R' = Tigloyl

Gymnemic acid VI

R = Gluc.acid(3→1)Glu, R' = H



Gymnemic acid VII

BIOLOGICAL ACTIVITY

Gymnemic acids inhibited glucan formation by *Streptococcus mutans* *in vivo* and also markedly inhibited the activity of glucosyltransferase from bacterial coat of *S. mutans*. Gymnemic acids useful for prevention of the formation of dental plaque and caries (Yonago Igaku Zasshi 1987, 38, 127; Chem. Abstr. 1987, 107, 89854 e).

GYMNOSPORIA (Celastraceae)

G. ovata (Wt. & Arn.) Lawson; see *Maytenus ovatus* (Wall. ex Wt. & Arn.) Loesener

GYNANDROPSIS (Capparaceae)

G. gynandra (L.) Briq.; see *Cleome gynandra* L.

G. pentaphylla (L.) DC.; see *Cleome gynandra* L.

GYNOSTEMMA (Cucurbitaceae)

G. pedata Blume; see *G. pentaphyllum* (Thunb.) Makino

G. pentaphyllum (Thunb.) Makino syn. *G. pedata* Blume (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 327).

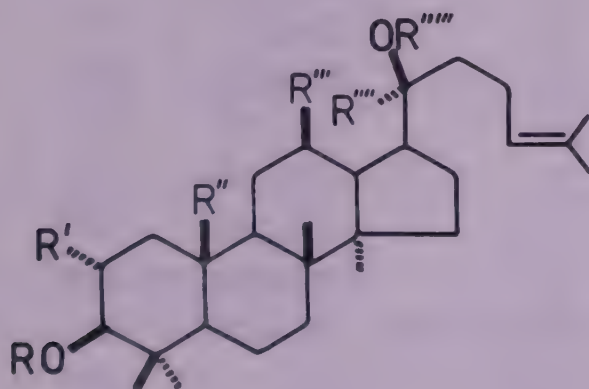
Saponins suggested as health food supplements because of their anticholesterolaemic activity in rats (Jpn. 6,043,358 (1983) Mar. 07; Chem. Abstr. 1985, 103, 48167 g); aqueous extract contained a PAF which differed from other agonists known to activate platelets' it was a glycoside or polysaccharide in nature (Chem. Pharm. Bull. 1985, 33, 5568).

Four dammarane oligoglycosides - gypenosides XXXVI, XXXVII, LIII and LIV - isolated from aerial parts and characterised (Yakugaku Zasshi 1984, 104, 939; Chem. Abstr. 1985, 102, 119478 b); gypenosides XLII, XLIII, XLIV, XLV and XLVI isolated and their structures determined; gynosaponin TN-1, gypenosides I, II, V and VII also isolated (Yakugaku Zasshi 1984, 104, 1043; Chem. Abstr. 1985, 102, 137637 g); isolation and structure elucidation of five dammarane oligoglucosides - gypenosides XLVII, XLVIII, XLIX, L and LI (Yakugaku Zasshi 1984, 104, 1155; Chem. Abstr. 1985, 102, 128799 j); gypenosides LVI, LVII, LVIII, LIX and LX isolated from aerial parts along with gypenosides V, IX, XLIII, XLV and ginsenoside-Rb3, and characterised (Yakugaku Zasshi 1986, 106, 664; Chem. Abstr. 1986, 105, 213987 a); gypenosides LXI, LXII, LXIII, LXIV and LXVII also isolated and their structures determined by ¹³C-NMR (Yakugaku Zasshi 1986, 106, 758; Chem. Abstr. 1987, 106, 9264 d); new gypenosides LXVIII, LXIX, LXX and LXXI isolated from plant grown in Miyagi prefecture (Yakugaku Zasshi 1987, 107, 262; Chem. Abstr. 1987, 107, 46140 b); isolation of gypenosides LXV, LXVI, LXXII, LXXIII and LXXIX from plant collected in Wakayama prefecture together with gypenosides II, VII, XLV and gynosaponin TN-2 (Yakugaku Zasshi

1987, 107, 355; *Chem. Abstr.* 1987, 107, 130904 n); gypenosides LXXIV, LXXV and LXXVI isolated from plant grown in Sodegaura; gypenosides LXXVII and LXXVIII isolated from plant grown in Oozu and characterised; gypenosides VII, IX, XIII, LXV and gynosaponins TN-1 and TN-2 also isolated from plants grown in Sodegaura and Oozu (*Yakugaku Zasshi* 1987, 107, 361; *Chem. Abstr.* 1987, 107, 130905 n); all above listed gypenosides isolated from aerial parts.

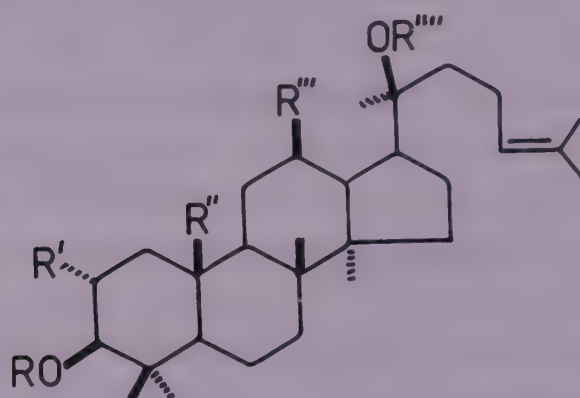
Three new sterols - 24,24-dimethyl-5 α -cholest-7-en-3 β -ol, 24,24-dimethyl-5 α -cholesta-7,22(E)-dien-3 β -ol and 24,24-dimethyl-5 α -cholesta-7,25-dien-3 β -ol - isolated and characterised (*Lipids* 1986, 21, 515; *Chem. Abstr.* 1986, 105, 187582 t); isolation of 14 α -methyl-5 α -ergosta-9(11),24(28)-dien-3 β -ol from aerial parts and its structure elucidation (*Phytochemistry* 1987, 26, 2412); 24,24-dimethyl-5 α -cholest-8-en-3 β -ol isolated from unsaponifiable lipid and characterised (*Yukagaku* 1988, 37, 659; *Chem. Abstr.* 1988, 109, 226729 a); 24,24-dimethyl-5 α -cholestan-3 β -ol isolated from aerial parts along with 24 α -ethyl-5 α -cholestan-3 β -ol (*Phytochemistry* 1988, 27, 2931); three acetylenic sterols -24(R)5 α -stigmast-7-en-22-yn-3 β -ol, 24,24-dimethyl-5 α -cholest-7-en-22-yn-3 β -ol and 24,24-dimethyl-5 α -cholesta-7,25-dien-22-yn-3 β -ol - isolated (*J. Org. Chem.* 1989, 54, 606); two new sterols isolated from aerial parts and shown to be 24(R)- and 24(S)-epimers of 14 α -methyl-5 α -ergost-9(11)-en-3 β -ol (*Phytochemistry* 1989, 28, 1271); isolation and structure elucidation of 6''-malonylgypenoside V from fresh leaves along with 6''-malonylginsenosides Rb1 and Rd (*Chem. Pharm. Bull.* 1989, 37, 135).

NEW COMPOUNDS

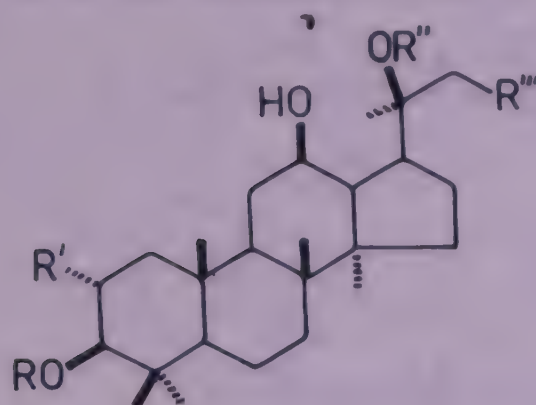


| Gypenosides | R | R' | R'' | R''' | R'''' | R''''' |
|-------------|-------------|----|-----|------|-------|-------------|
| XXXVI | Ara(2→1)Glu | H | CHO | H | Me | Rutinose |
| XXXVII | Ara(2→1)Glu | H | CHO | H | Me | Primeverose |
| XLII | Sophorose | OH | Me | OH | Me | Gentiobiose |
| XLIII | Sophorose | OH | Me | OH | Me | Rutinose |
| XLIV | Glu | OH | Me | OH | Me | Gentiobiose |
| XLV | Glu | OH | Me | OH | Me | Rutinose |
| XLVI | Sophorose | OH | Me | OH | Me | Glu |

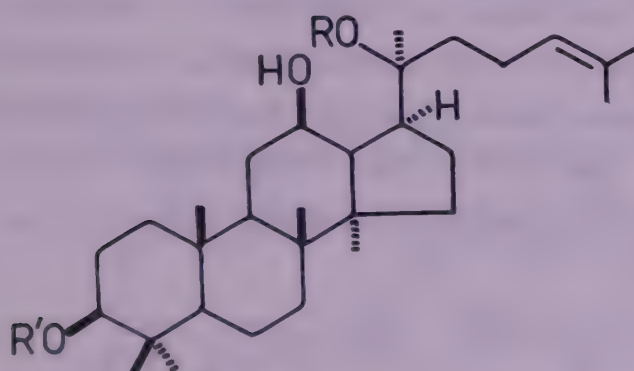
| Gypenosides | R | R' | R'' | R''' | R'''' | R''''' |
|-------------|---------------------|----|--------------------|------|-----------------------|---------|
| XLVIII | Ara(3→1)Glu(2→1)Rha | H | CHO | H | CH ₂ O-Glu | H |
| XLIX | Ara(3→1)Xyl(2→1)Rha | H | CHO | H | CH ₂ O-Glu | H |
| L | Sophorose | OH | Me | OH | Me | H |
| LI | Sophorose | OH | Me | OH | Me | H |
| LIII | Ara(2→1)Glu | H | CH ₂ OH | OH | Me | H |
| LIV | Ara(2→1)Glu | H | CHO | OH | Me | H |
| LVI | Sophorose | OH | Me | OH | Me | Glu-Xyl |
| LVII | Glu | OH | Me | OH | Me | Glu-Xyl |
| LVIII | Ara(2→1)Glu | H | Me | OH | Me | Glu-Xyl |



| Gypenosides | R | R' | R'' | R''' | R'''' |
|-------------|-----------|----|--------------------|------|-------------|
| LXII | Sophorose | H | CH ₂ OH | OH | Glu(6→1)Xyl |
| LXIII | Sophorose | H | CH ₂ OH | H | Glu(6→1)Xyl |
| LXIV | Glu | H | CH ₂ OH | OH | Glu(6→1)Xyl |
| LXV | H | H | CH ₂ OH | OH | Primeverose |
| LXVI | H | H | CH ₂ OH | OH | Rutinose |
| LXVII | Sophorose | OH | CH ₂ OH | H | Glu(6→1)Xyl |
| LXXII | Rutinose | H | CH ₂ OH | OH | Glu |
| LXXIII | Glu | OH | Me | H | Rutinose |
| LXXIV | H | OH | Me | OH | Gentiobiose |
| LXXV | H | H | Me | OH | Gentiobiose |
| LXXVI | H | H | CH ₂ OH | OH | Glu |
| LXXVII | H | OH | Me | OH | Primeverose |
| LXXVIII | H | OH | Me | H | Primeverose |
| LXXIX | Glu | H | CH ₂ OH | H | Glu |



| Gypenosides | R | R' | R'' | R''' |
|-------------|-----------|----|-------------|---|
| XLVII | Sophorose | OH | Rutinose | CH ₂ CH = C(Me)CH ₂ OH |
| LIX | H | OH | Glu-Xyl | CH ₂ CH = C(Me)CH ₂ OH |
| LX | H | OH | Glu(6→1)Xyl | CH = CHC(OH)Me ₂ |
| LXI | Sophorose | OH | Glu(6→1)Xyl | CH ₂ CH = C(Me)CH ₂ OH |
| LXVIII | Sophorose | OH | Glu(6→1)Xyl | CH = CHC(OH)Me ₂ |
| LXIX | Sophorose | H | Glu(6→1)Xyl | CH = CHC(OH)Me ₂ |
| LXX | Sophorose | H | Glu(6→1)Xyl | CH ₂ CH = C(Me)CH ₂ OH |
| LXXI | Sophorose | H | Glu(6→1)Xyl | CH ₂ CH(OH)C(Me) = CH ₂ |



6''-Malonylgypenoside V

R = Glu(6→1)Rha, R' = Glu(2→1)Glu(6''-malonyl)

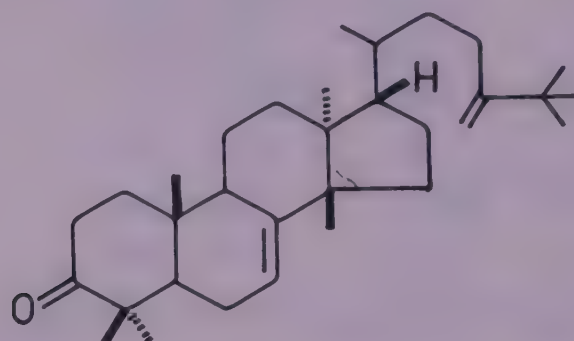
GYNURA (Asteraceae)*G. crepidioides* Benth.; see *Crassocephalum crepidioides* (Benth.) Moore**GYRINOPS (Thymelaeaceae)***G. walla* Gaertn.

Epifriedelinol and its acetate, friedelin, apigenin-7,4'-dimethyl ether, luteolin-7,3',4'-trimethyl ether, velutin, pilloin, genkwanin, mangiferin, (+)syringaresinol, sitoindoside I, cucurbitacin I and 2,6-dimethoxybenzoquinone isolated from twigs and leaves (*J. Nat. Prod.*

1985, 48, 684); a new triterpenoid - wallenone - isolated and its structure determined by X-ray analysis (*Phytochemistry* 1986, 25, 753).

Distribution : Tirunelveli in Tamil Nadu and Western Ghats.

NEW COMPOUNDS



Wallenone

GYROCARPUS (Hernandiaceae)

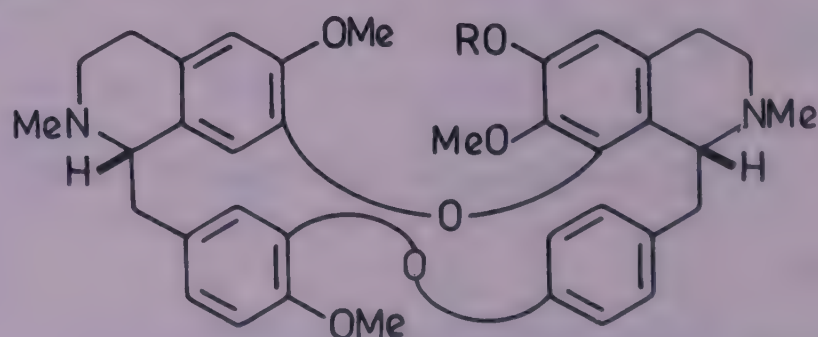
G. americanus Jacq. syn. *G. jacquinii* Roxb., *G. asiaticus* Willd.

H., B. & Guj. - Zaitun; Kan. - Kadubende, Pollika; Oriya - Pitella, Sutorono; Tam. - Kadavai, Karamanikkay, Teppam, Munuvu; Tel. - Tanuku, Nallaponaku.

Five new dimeric alkaloid - O-methyllymacusine, gyrocarpusine, gyroamericine, gyroline and gyrocarpine - isolated and their structures established; (+)reticuline, (+)limacine, (+)isotetrandrine, (+)domesticine and (+)N-methylcocclaurine also isolated (*J. Nat. Prod.* 1986, 49, 101); isolation and characterisation of two new seco-bisbenzylisoquinoline dimers - (+)auroramine and maroumine - from leaves (*Phytochemistry* 1988, 27, 655).

Distribution : Peninsular India, Orissa, Bengal and Andaman Islands.

NEW COMPOUNDS

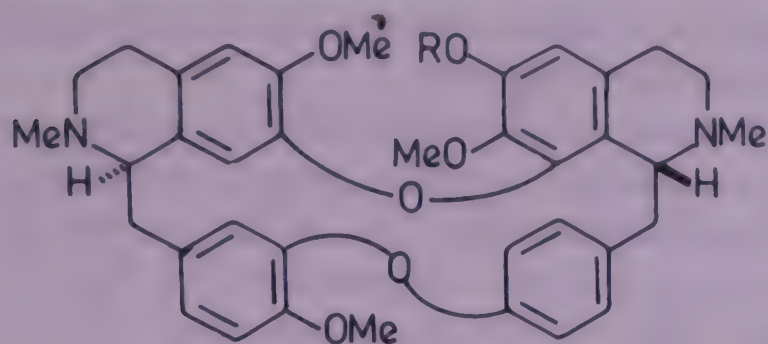


Gyrolidine

R = Me

Gyrocarpine

R = H

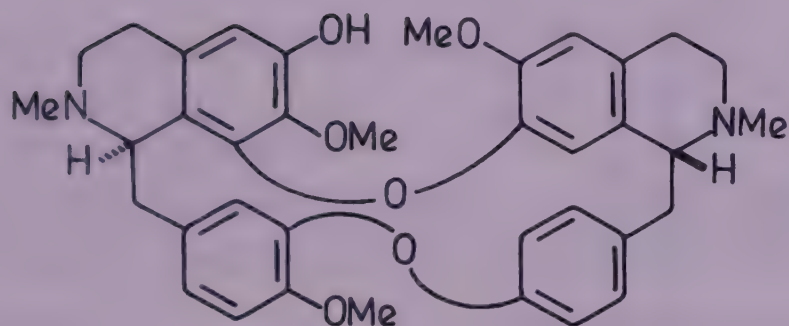


O-Methyllymacusine

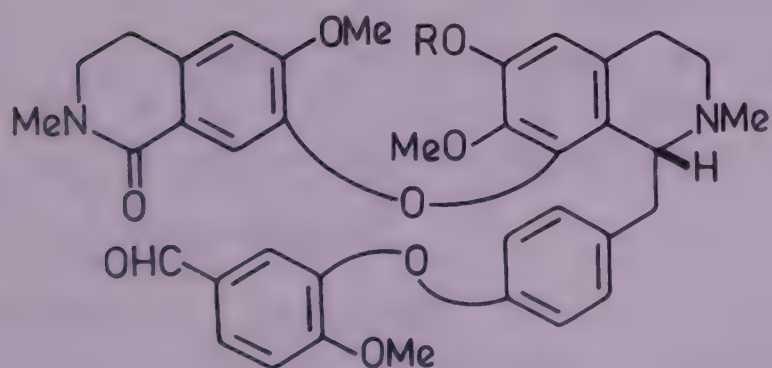
R = Me

Gyrocarpusine

R = H



(-)-Gyroamericine



(+)Auroramine

R = Me

(+)Maroumine

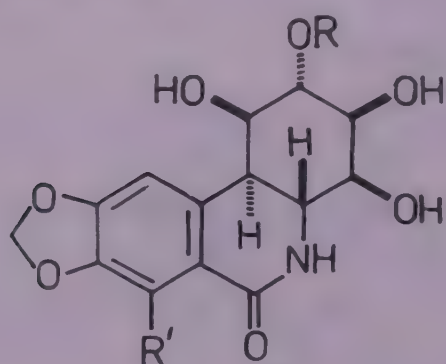
R = H

G. asiaticus Willd.; see *G. americanus* Jacq.*G. jacquinii* Roxb.; see *G. americanus* Jacq.**HAEMANTHUS** (Amaryllidaceae)*H. kalbreyeri* Baker; see *H. multiflorus* Martyn

H. multiflorus Martyn syn. *H. kalbreyeri* Baker (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 206).

Isolation of kalbretorine and kalbreclasine from roots and their structure determination; haemanthamine, haemanthidine, hippadine, lycorine, narciclasine, pancratistatine and pratorimine also isolated (*Phytochemistry* 1985, 24, 182; *ibid.* 1989, 28, 611); galanthamine, sanguinine and lycorine isolated from Ethiopian plant (*Bull. Pharm. Sci., Assiut Univ.* 1987, 10, 157; *Chem. Abstr.* 1989, 110, 4737 h); isolation of two new isocarbostryl alkaloids - 7-deoxy-pancratistatine and pancratistide - from bulbs and their structure elucidation (*Phytochemistry* 1989, 28, 611).

NEW COMPOUNDS



7-Deoxypancratistatine

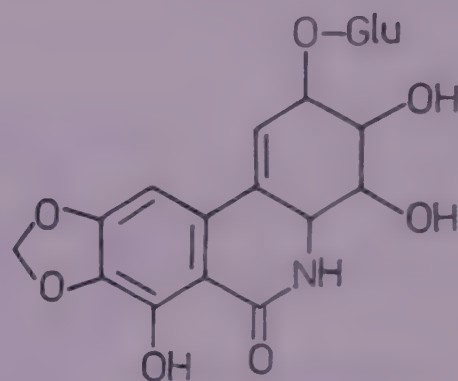
R,R' = H

Pancratistatine

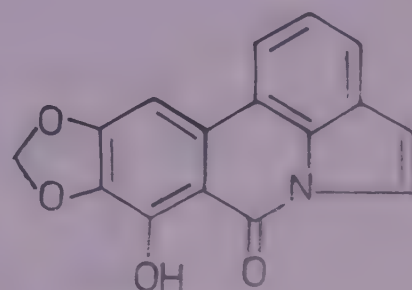
R = H, R' = OH

Pancratistide

R = Glu, R' = OH



Kalbreclasine



Kalbretorine

BIOLOGICAL ACTIVITY

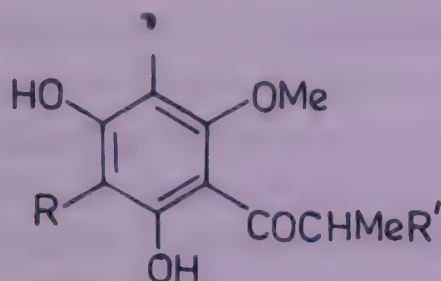
Kalbretorine markedly inhibited growth and viability of S-180 tumor cells, whereas kalbreclasine caused significant mitogenic activation of splenic lymphocytes (*Phytochemistry* 1985, 24, 1825).

HAGENIA (Rosaceae)

H. abyssinica Gmel. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 356).

Structures of kosins K6 and K8 confirmed by synthesis (*Z. Naturforsch.* 1985, 40B, 681; *Chem. Abstr.* 1985, 103, 141718 x); cyanidin-3-glucoside and cyanidin-3-sophoroside identified in female flowers by TLC and HPLC (*Fitoterapia* 1987, 58, 136).

NEW COMPOUNDS



Kosin K6

R = CHO, R' = Me

Kosin K8

R = Me, R' = Et

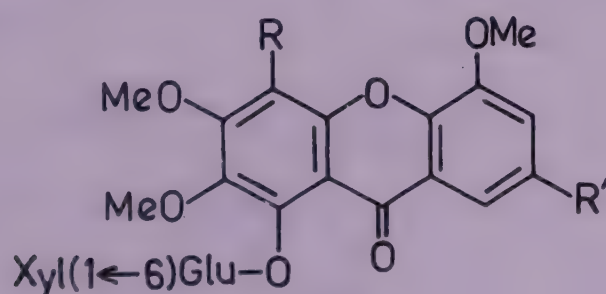
HALENIA (Gentianaceae)

H. elliptica D.Don (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 329).

Herb used for treatment of liver.

Three new xanthone glycosides - haleniaside, demethoxyhaleniaside and (I) - isolated from herb and their structures elucidated (*Zhiwu Xuebao* 1987, 29, 422; *Chem. Abstr.* 1988, 108, 118798 t).

NEW COMPOUNDS



Haleniaside

R = H, R' = OMe

Demethoxyhaleniaside

R, R' = H

I

R = OMe, R' = H

HAMILTONIA (Rubiaceae)

H. suaveolens Hook.f.; see *Spermadictyon suaveolens* Roxb. var. *suaveolens*

HARDWICKIA (Caesalpiniaceae)*H. binata* Roxb.

H., Mar. & S. - Anjan, Anjun; Bo. - Parsid; Gond. - Chhota dundhera; Kan. - Kamra, Karachi, Acca; Tam. - Acha, Calam, Katudugu; Tel - Yepi, Epi, Naraepi; Trade - Anjan.

(+)Taxifolin, eriodictyol, (+)catechin, (+)epicatechin, (+)mopanol and β -sitosterol isolated from heartwood (*Fitoterapia* 1987, 58, 422).

Distribution : Uttar Pradesh, Bihar, central India and Deccan Peninsula.

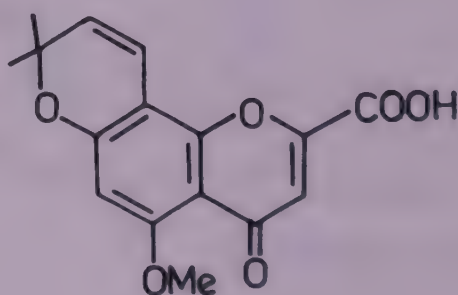
H. pinnata Roxb.; see *Kingiodendron pinnatum* (Roxb. ex DC.) Harms.

HARRISONIA (Simaroubaceae)

H. bennettii Hook.f. ex Bennett; see *H. perforata* (Blanco) Merr.

H. perforata (Blanco) Merr. syn. *H. bennettii* Hook.f. ex Bennett (nom. illeg.), *Limonia pubescens* Wall. ex Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 331).

Perforatic acid isolated from roots of Chinese plant (*Yaoxue Xuebao* 1984, 19, 760; *Chem. Abstr.* 1985, 102, 84297 n); crystal structure of perforatic acid determined (*Jiegou Huaxue* 1985, 4, 281; *Chem. Abstr.* 1987, 106, 18191 e).

NEW COMPOUNDS

Perforatic acid

BIOLOGICAL ACTIVITY

Perforatic acid inhibited incorporation of 3H-thymidine into mouse hepatic carcinoma ascites cells *in vitro* (*Yaoxue Xuebao* 1984, 19, 760; *Chem. Abstr.* 1985, 102, 84297 n).

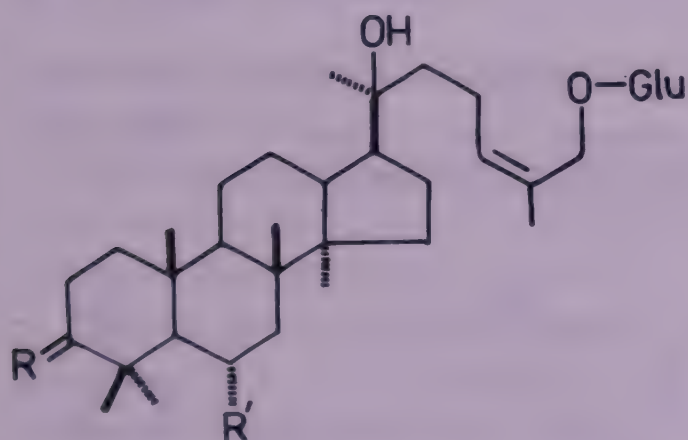
HEDERA (Araliaceae)

H. helix L.; see *H. nepalensis* K. Koch

H. nepalensis K. Koch syn. *H. helix* auct. (non L.), *H. rhombea* Sieb. & Zucc. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 332).

Eleven triterpene glycosides - kizuta saponins K2, K4, K5, K7, K7A, K7B, K7C, K8, K9, K11 and K13 - isolated from stem bark; kizuta saponins K4, K5, K7 and K7C characterised as 3-O-acetyl-dammar-24(Z)-ene-3 β ,6 α ,20,26-tetraol-26-O- β -D-glucopyranoside (K4); 3-oxo-dammar-24(S)-ene-6 α ,20,26-triol-26-O- β -D-glucopyranoside (K5); dammar-24(S)-ene-3 β ,6 α ,20,26-tetraol-26-O- β -D-glucopyranoside (K7) and dammar-24(S)-ene-3 β ,20,26-triol-3,26-di-O- β -D-glucopyranoside (K7C) (*Chem. Pharm. Bull.* 1985, 33, 1400); structures of kizuta saponins K7A, K7B, K9 and K13 established (*Chem. Pharm. Bull.* 1985, 33, 3176); kizuta saponins K8 and K11 characterised as 3-O- α -L-arabinopyranoside and 3-O- α -L-glucopyranosyl(1 \rightarrow 2)arabinopyranoside of hederagenin-28-O- α -L-rhamnopyranosyl(1 \rightarrow 4)-6-O-acetyl- β -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranosyl ester respectively (*Chem. Pharm. Bull.* 1985, 33, 3473); isolation of kizuta saponins K3, K6, K10, K11 and K12 from leaves and stem bark of Nepalese plant (*Shoyakugaku Zasshi* 1985, 39, 170; *Chem. Abstr.* 1985, 104, 115940 q; *Chem. Pharm. Bull.* 1985, 33, 3324); in addition HN-saponins D1, D2, F, H, I and K isolated from stem and bark and identified as hederagenin-3-O- β -D-glucopyranoside; oleanolic acid-3-O- α -L-rhamnopyranosyl(1 \rightarrow 2)- α -L-arabinopyranoside; 3-O- α -L-arabinopyranosylhederagenin-28-O- β -D-glucopyranosyl ester; hederagenin-28-O- α -L-rhamnopyranosyl (1 \rightarrow 4)- β -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranosyl ester; oleanolic acid-3-O- β -D-glucopyranoside and hederagenin-3-O- β -D-glucuronopyranoside respectively; HN-saponin A also isolated and found to be a mixture of glucosides of campesterol, stigmasterol and β -sitosterol (*Chem. Pharm. Bull.* 1985, 33, 3324).

NEW COMPOUNDS



Kizutasaponin K4

R = β -OAc, α -H, R' = OH

Kizutasaponin K5

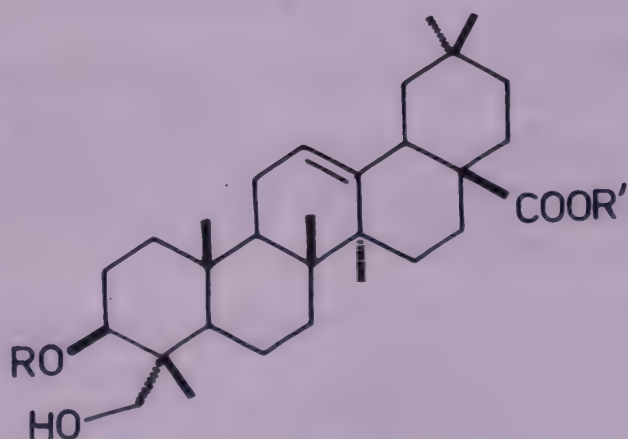
R = O, R' = OH

Kizutasaponin K7

R = β -OH, α -H, R' = OH

Kizutasaponin K7C

R = β -O-Glu, α -H, R' = H



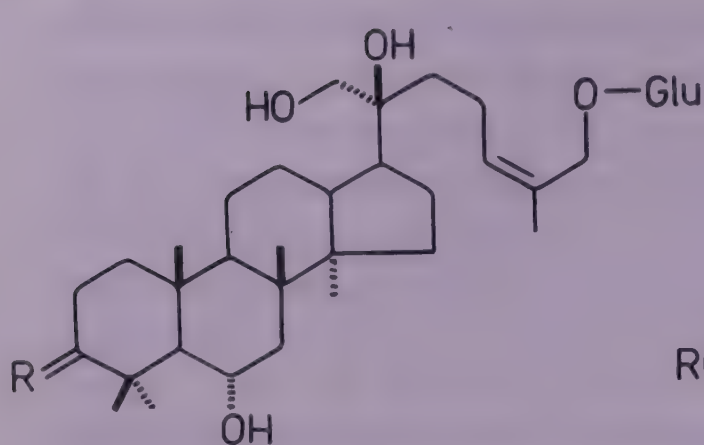
Kizutasaponin K8

R = Ara, R' = Glu(6 \rightarrow 1)Glu[(4 \rightarrow 1)Rha]-(6'-acetyl)

Kizutasaponin K11

R = Ara(2 \rightarrow 1)Rha,

R' = Glu(6 \rightarrow 1)Glu-[(4 \rightarrow 1)Rha](6'-acetyl)

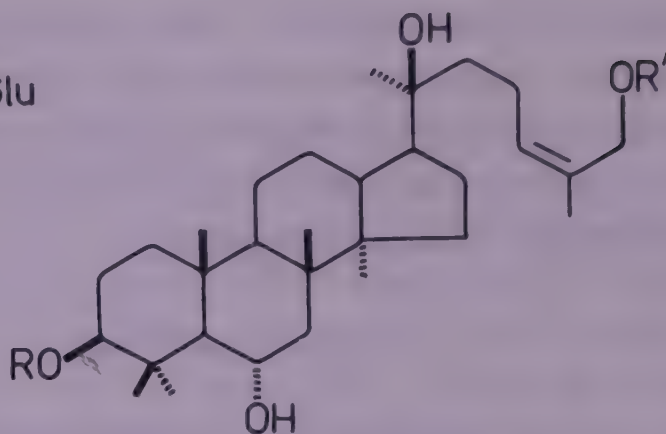


Kizutasaponin K7A

R = O

Kizutasaponin K7B

R = H, OH



Kizutasaponin K9

R, R' = Glu

Kizutasaponin K13

R = Sophorose, R' = Glu

H. rhombea Sieb. & Zucc.; see *H. nepalensis* K. Koch

HEDYCHIUM (Zingiberaceae)

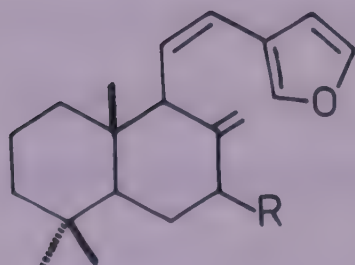
H. acuminatum Rosc. syn. *H. spicatum* Ham. ex Smith var. *acuminatum* (Rosc.) Wall. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 359).

1,8-Cineole as major component along with linalool, (-)cadinol, (+)elemol, (-)epi-10-γ-eudesmol, (+)α- and (+)β-eudesmols isolated from rhizome oil (*J. Nat. Prod.* 1987, 50, 732).

H. coronarium Koen. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 332).

Isolation and structure elucidation of new labdane diterpenes - coronarins A, B, C and D - from rhizomes (*Planta Med.* 1988, 54, 311); coronarin E and coronarin F isolated from rhizomes of Brazilian plant and characterised (*Chem. Pharm. Bull.* 1988, 36, 2682).

NEW COMPOUNDS

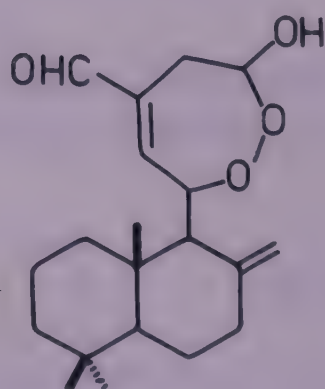


Coronarin A

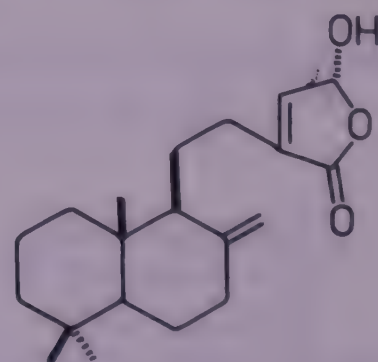
R = OH

Coronarin E

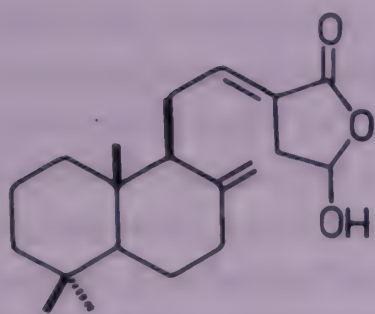
R = H



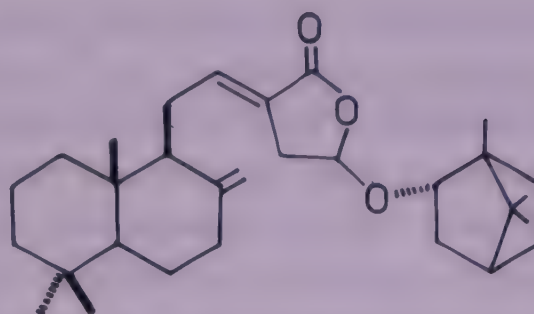
Coronarin B



Coronarin C



Coronarin D



Coronarin F

H. spicatum Ham. ex Smith (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 332).

Hexane extract of rhizomes showed marked anti-inflammatory activity, whereas benzene extract possessed significant analgesic activity.

Hedychenone isolated from rhizomes (*Indian J. Pharmacol.* 1984, 16, 143).

H. spicatum Ham. ex Smith var. *acuminatum* (Rosc.) Wall.; see *H. acuminatum* Rosc.

HEDYOTIS (Rubiaceae)

H. diffusa Willd. syn. *Oldenlandia diffusa* (Willd.) Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 333).

New anthraquinone isolated and characterised as 2,3-dimethoxy-6-methylantraquinone (*Phytochemistry* 1986, 25, 1988).

HELIANTHUS (Asteraceae)

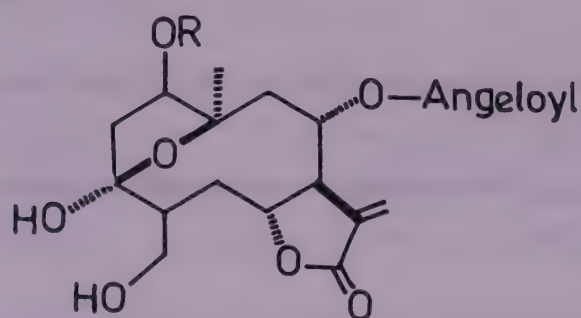
H. annuus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 334).

Root extract at 10.0 mg inhibited germination of mustard, amaranthus and wild oats by 52, 72 and 60% and at 50.0 mg by 90, 100 and 100% respectively (*Deposited Doc.* VINITI 1983, 3851; *Chem. Abstr.* 1985, 103, 34927 t).

Vanillin, ayapin, demethoxyencecaline and demethoxyencecalol isolated from stalk (*Fitoterapia* 1984, 55, 307); isolation of ent-kaur-16-en-19-al, ent-trachyloban-19-al, ent-kauran-16 β -ol, ent-kauran-16 α -ol, ent-kauran-16 β ,19-diol, ent-atisan-16 α -ol, ent-atisan-16 β -ol and two esters of ent-kaur-16-en-19-oic and ent-trachyloban-19-oic acids with thujanol from flowers (*J. Nat. Prod.* 1984, 47, 822); a new furanoheliangolide - 4,5-dihydroniveusin A - isolated from plant grown in Texas, along with niveusin B, argophyllin A, argophyllin B and grandifloric, ciliaric and 17-hydroxy-ent-isokaur-15(16)-en-19-oic acids; structure of new compound established (*Phytochemistry* 1985, 24, 1537); isolation and characterisation of a new seco-triterpene - 3-hydroxy-3,4-seco-dammara-4,24-diene (I) - from pollen grains along with p-coumaric, caffeic and ferulic acids, palmitic acid- α -monoglyceride, quercetin-7- β -D-gluc-

side and avenasta-7-en-ol (*Shoyakugaku Zasshi* 1986, 40, 172; *Chem. Abstr.* 1987, 106, 38303 w); niveusin C, argophyllin B and 15-hydroxy-3-dehydrodesoxyfruticin isolated from glandular trichomes of leaves (*J. Plant Physiol.* 1987, 130, 430; *Chem. Abstr.* 1988, 108, 52827 t; *Phytochemistry* 1989, 28, 745); new 15β -hydroxylated gibberellins - GA64, GA65, GA66, GA67, GA72 - and 15β -hydroxylated derivatives of GA17, GA19, GA44 and GA53 - isolated from seeds along with GA1, GA4, GA19, GA20 and GA45; abscisic acid, dihydrophaseic acid, ent- $7\alpha,16\alpha,17$ -trihydroxy- 16α -H-kauranoic acid, ent- $7\alpha,16\beta,17$ -trihydroxy- and ent- $6\alpha,7\alpha,16\beta,17$ -tetrahydroxy- 16β H-kauranoic acids also detected in seeds by GC-MS (*Phytochemistry* 1988, 27, 2695); three new germacranolides - 1-methoxy-4,5-dihydroniveusin A, 1,2-anhydridoniveusin A and 1,2-anhydrido-4,5-dihydroniveusin A - isolated from glandular trichomes of leaves and their structures determined; ketonic structure assigned to 1,2-anhydrido-4,5-dihydroniveusin A on basis of NMR spectral studies (*Phytochemistry* 1989, 28, 745); isolation of brassinolide, castasterone and brassinone (norcastasterone) from pollens (*Agric. Biol. Chem.* 1989, 53, 2177).

NEW COMPOUNDS

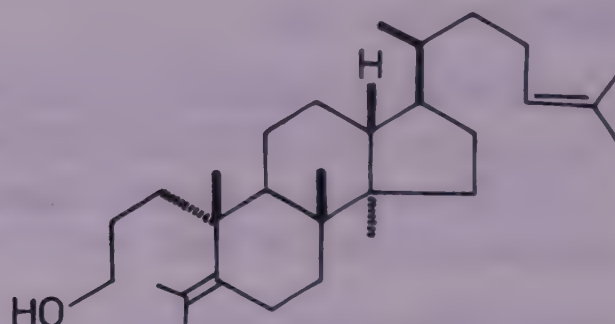


4,5-Dihydroniveusin A

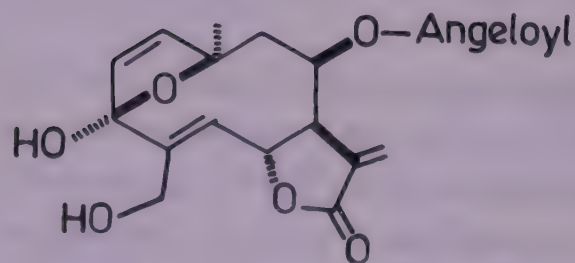
R = H

1-Methoxy-4,5-dihydroniveusin A

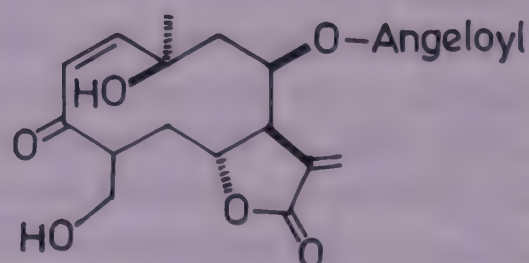
R = Me



I



1,2-Anhydridoniveusin A



1,2-Anhydrido-4,5-dihydroniveusin A

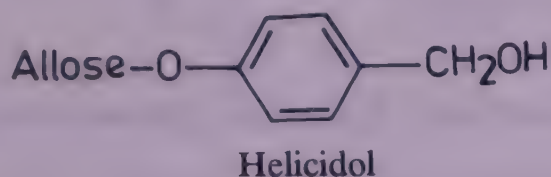
HELICIA (Proteaceae)

H. erratica Hook.f.; see *H. nilagirica* Bedd.

H. nilagirica Bedd. syn. *H. erratica* Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 337).

Helicidol isolated from seeds and its structure elucidated (*Planta Med.* 1986, 52, 412).

NEW COMPOUNDS



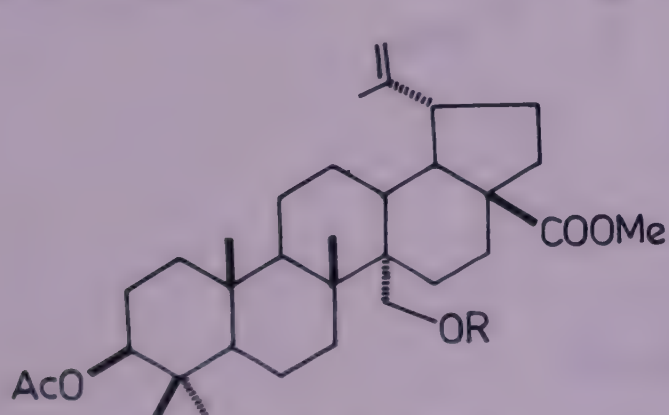
HELICTERES (Sterculiaceae)

H. angustifolia L.

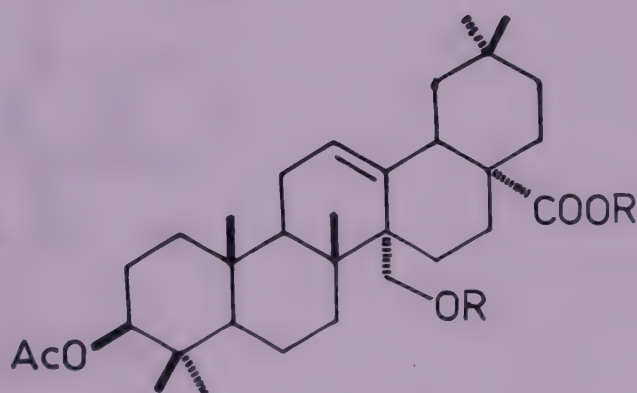
Isolation and characterisation of three new triterpenoids - methyl helicterate, methyl helicterilate and helicterilic acid; β -sitosterol, betulinic acid and oleanolic acid also isolated (Yaoxue Xuebao 1985, 20, 842; *Chem. Abstr.* 1986, 105, 3522 u); a new naphthoquinone - helicquinone - isolated from roots and its structure determined (*Phytochemistry* 1987, 26, 578).

Distribution : Kamorta in Nicobar Islands.

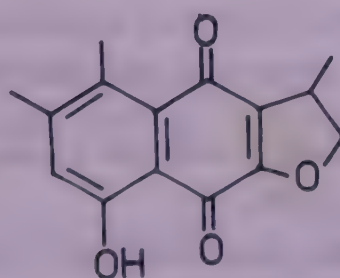
NEW COMPOUNDS



Methylhelicterate
R = Benzoyl



Helicterilic acid
R = Benzoyl, R' = H
Methylhelicterilate
R = Benzoyl, R' = Me



Helicquinone

H. isora L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 337).

A new ester isolated from leaves and characterised as tetratriacontanyl tetratriacontanoate (*Indian J. Pharm. Sci.* 1984, 46, 148); cucurbitacin B and isocucurbitacin B identified in roots by HPLC (*J. Nat. Prod.* 1985, 48, 500).

BIOLOGICAL ACTIVITY

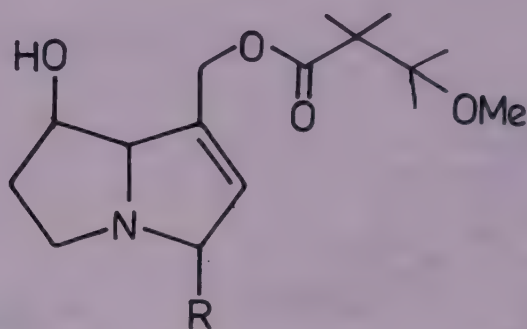
Cucurbitacin B and isocucurbitacin B exhibited cytotoxic activity (*J. Nat. Prod.* 1985, 48, 500).

HELIOTROPIUM (Boraginaceae)

H. crispum Desf. syn. *H. tuberosum* Boiss., *H. undulatum* sensu Cl., p.p., *H. ramosissimum* Sieb. ex DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 338).

Three pyrrolizidine alkaloids (I, II and III) isolated from aerial parts and their structures elucidated (*J. Biol. Sci. Res.* 1987, 18, 127; *Chem. Abstr.* 1987, 107, 205002 b).

NEW COMPOUNDS



I

R = CH(Me)OH

II

R = CH=CH₂

III

R = H

BIOLOGICAL ACTIVITY

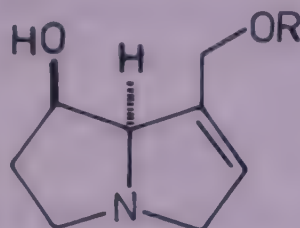
Pyrrolizidine alkaloids I, II and III showed serum cholinesterase inhibitory activity (*J. Biol. Sci. Res.* 1987, 18, 127; *Chem. Abstr.* 1987, 107, 205002 b).

H. curassavicum L. var. *curassavicum* (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 338).

Crystal structure of heliotridine determined (*Acta Crystallogr., Cryst. Struct. Commun.* 1985, 41C, 1342; *Chem. Abstr.* 1986, 104, 51008 g); synthesis of (+)heliotridine (*Tetrahedron Lett.* 1985, 26, 2857; *Tetrahedron* 1985, 41, 3959; *Chem. Commun.* 1988, 685); isolation and

structure determination of a new pyrrolizidine alkaloid - 9-(3'-isovaleryl)viridifloryl-retronecine and its 7-acetyl derivative (*Phytochemistry* 1988, 27, 960).

NEW COMPOUNDS



9-(3'-Isovaleryl) viridifloryl-retronecine

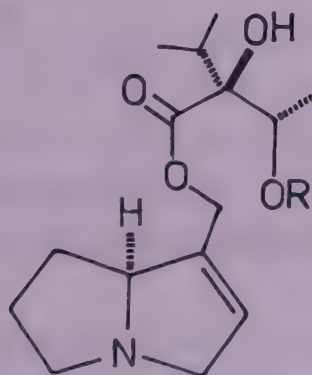


H. indicum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 338).

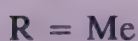
Petroleum ether extract (0.5 g/kg) exhibited antifertility activity in female rats, whereas aqueous extract did not show any postcoital antifertility effect (*Indian Drugs* 1985, 22, 567).

Petroleum extract afforded n-hexacosanol and a mixture of sitosterol (58.4), stigmasterol (31.42), campesterol (8.34) and chalinasterol (1.65%) (*Indian Drugs* 1985, 22, 567); absolute structure of supinine and heleurine by X-ray analysis (*Acta Crystallogr., Cryst. Struct. Commun.* 1985, 41C, 722; *Chem. Abstr.* 1985, 103, 54344 d).

NEW COMPOUNDS



Heleurine



Supinine



H. marifolium Retz. var. *marifolium*

Antitumor alkaloids - heliotrine (0.08), lasiocarpine (0.14), europine (0.12), indicine N-oxide (0.01) and lasiocarpine N-oxide (0.01%) - isolated from aerial parts (*Chem. Pharm. Bull.* 1986, 34, 5154).

Distribution : South India in plains and Rajasthan.

H. ovalifolium Forsk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 338).

Crystal structure of retronecine determined (*Acta Crystallogr., Cryst. Struct. Commun.* 1985, 41C, 1342; *Chem. Abstr.* 1986, 104, 51008 g); stereoselective synthesis of (+)retronecine (*Chem. Commun.* 1988, 685); linoleic, α -linolenic, oleic, palmitic acids and β -sitosterol identified in leaves (*Herba Hung.* 1989, 28, 7; *Chem. Abstr.* 1989, 111, 150585 u).

H. ramosissimum Sieb. ex DC.; see *H. crispum* Desf.

H. strigosum Willd. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 210).

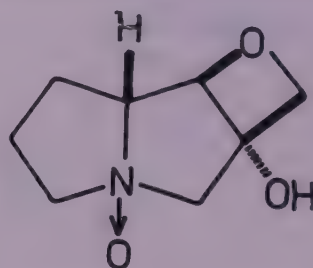
A cyanodiol - 1-cyano-2-hydroxymethylprop-1-en-3-ol - identified in seed oil (*J. Oil Technol. Assoc. India* 1985, 17, 10; *Chem. Abstr.* 1985, 103, 211149 p).

H. subulatum (DC.) Vatke syn. *H. zeylanicum* Clarke (non Lamk.)

Isolation of a new pyrrolizidine alkaloid - subulacine N-oxide - and its stereostructure determination (*Heterocycles* 1988, 27, 707).

Distribution : Deccan Peninsula.

NEW COMPOUNDS



Subulacine N-oxide

H. supinum L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 210).

1-Cyano-2-hydroxymethylprop-1-en-3-ol identified in seed oil (*J. Oil Technol. Assoc. India* 1985, 17, 10; *Chem. Abstr.* 1985, 103, 211149 p).

H. tuberosum Boiss.; see *H. crispum* Desf.

H. undulatum Cl.; see *H. crispum* Desf.

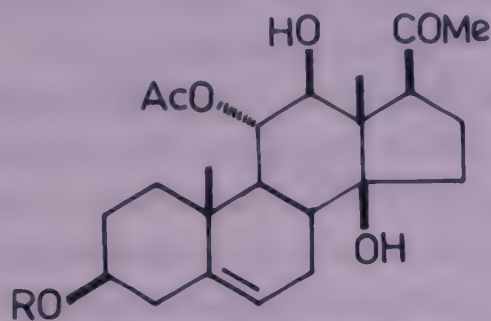
H. zeylanicum Lamk.; see *H. subulatum* (DC.) Vatke

HEMIDESMUS (Asclepiadaceae)

H. indicus (L.) R.Br. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 364).

A new pregnane ester diglycoside - desinine - isolated from twigs and characterised as drevogenin B-3-O- β -D-oleandropyranosyl(1 \rightarrow 4)- β -D-oleandropyranoside (*Phytochemistry* 1985, 24, 2395).

NEW COMPOUNDS



Desinine

R = Oleandrose(4 \rightarrow 1)Oleandrose

HEPTAPLEURUM (Araliaceae)

H. impressum Clarke; see *Schefflera impressa* (Clarke) Harms

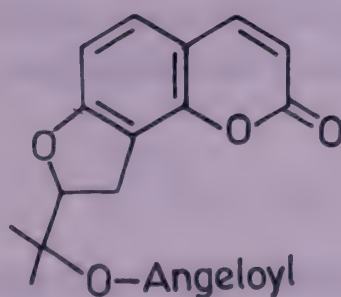
HERACLEUM (Apiaceae)

H. brunonis (DC.) Clarke

(+)Columbianetin, imperatorin, (+)heraclenol and bergapten isolated from roots (*J. Nat. Prod.* 1986, 49, 1139); isolation of a new coumarin - columbianadin - and its structure determination (*Planta Med.* 1987, 53, 581); roots afforded xanthotoxin, angelicin, pimpinellin and chrysophanol (*J. Nat. Prod.* 1987, 50, 997).

Distribution : Himalayas, from Himachal Pradesh to Bhutan, alt. 3000-5000 m.

NEW COMPOUNDS



Columbianadin

H. canescens Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 339).

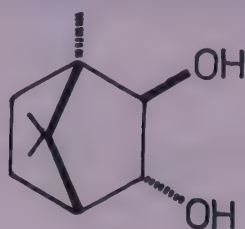
Detection of β -pinene (17.6), α -pinene (8.3), α -terpineol (4.3), p-cymene (3.6), β -elemene (2.1), nerolidol (2.0) and γ -cadinene (1.9%) in essential oil by GC-MS (*Parfuem.*

Kosmet. 1987, 68, 224; *Chem. Abstr.* 1987, 107, 64623 r); bergapten, isobergapten, 8-geranyloxypsoralen, xanthotoxin, imperatorin, heraclenin, heraclenol, osthol, stigmasterol and β -sitosterol isolated from seeds (*Indian Drugs* 1988, 25, 171).

H. concanense Dalz. syn. *H. grandiflorum* Dalz. & Gibson (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 211).

Root afforded sphondin, bergapten, isobergapten, pimpinellin, psoralen, xanthotoxin, heraclesol and byakangelicin (*Khim. Prir. Soedin.* 1984, 653; *Chem. Abstr.* 1985, 102, 42882 u); byakangelicin, its monoacetate and 5-(3-methyl-but-2-enyl)oxy-7-methoxycoumarin, 8-hydroxy-5-methoxyfuranocoumarin and 5,8-dimethoxyfuranocoumarin isolated from fruits (*Indian Drugs* 1988, 25, 178); isolation and characterisation of camphane-2,3-diol from fruits (*Indian Drugs* 1988, 25, 215).

NEW COMPOUNDS



Camphane-2,3-diol

Note : The current valid name for this taxon is *Pinda concanensis* (Dalz.) Mukherjee & Constance.

H. grandiflorum Dalz. & Gibson; see *H. concanense* Dalz.

H. sprengelianum W.& A. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 366).

Isolation of 5-(3-methyl-but-2-enyl)oxy-7-methoxycoumarin, 8-hydroxy-5-methoxyfuranocoumarin and 5,8-dimethoxyfuranocoumarin from fruits (*Indian Drugs* 1988, 25, 178); camphane-2,3-diol isolated from fruits (*Indian Drugs* 1988, 25, 215).

HERITIERA (Sterculiaceae)

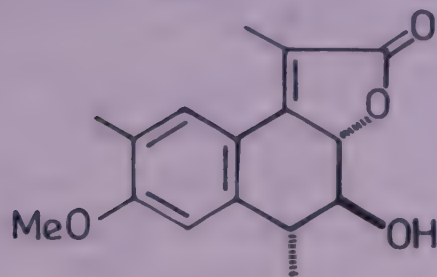
H. littoralis Ait.

Eng. - Looking glass tree; Kan. - Chandmara; Mal. - Mukuram, Nakam; Mar. - Sundrichand, Kolland; Tel. - Advaiabademu; Tam - Chomuntri, Kannadiyilai; Andaman - Mawtda.

A new sesquiterpene - heritianin - isolated and characterised (*ACS Symp. Ser.* 1987, 330, 491; *Chem. Abstr.* 1987, 106, 172901 t).

Distribution : Costal regions of peninsular India, Andaman Islands.

NEW COMPOUNDS



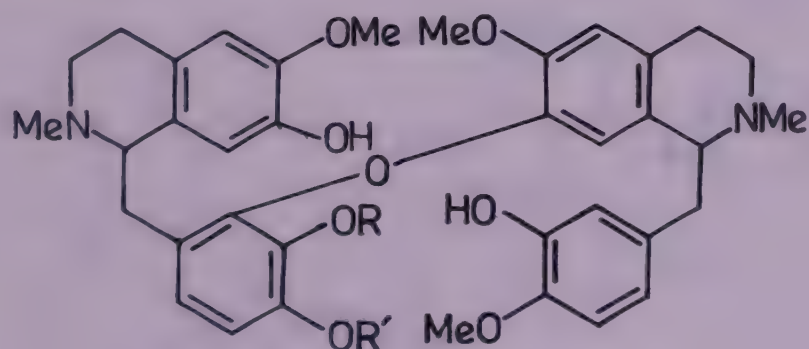
Heritianin

HERNANDIA (Hernandiaceae)

H. ovigera L. syn. *H. peltata* Meissn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 340).

Bursehernine, yateine, epiudesmine, epimagnoline and epiyangambine isolated from twigs (*J. Nat. Prod.* 1984, 47, 879); isolation and structure determination of efatine and ambriamine (*C.R. Acad. Sci. Paris, Ser. 2* 1985, 301, 1185; *Chem. Abstr.* 1986, 105, 134209 v); four new dimeric alkaloids - (+)6-northalcarpine, (+)thalicarpine 2'N-oxide, (+)hebridamine and (+)vilaportine - isolated from bark and their structures elucidated; 6,7-dehydrothalmelatine also isolated (*Can. J. Chem.* 1986, 64, 123).

NEW COMPOUNDS

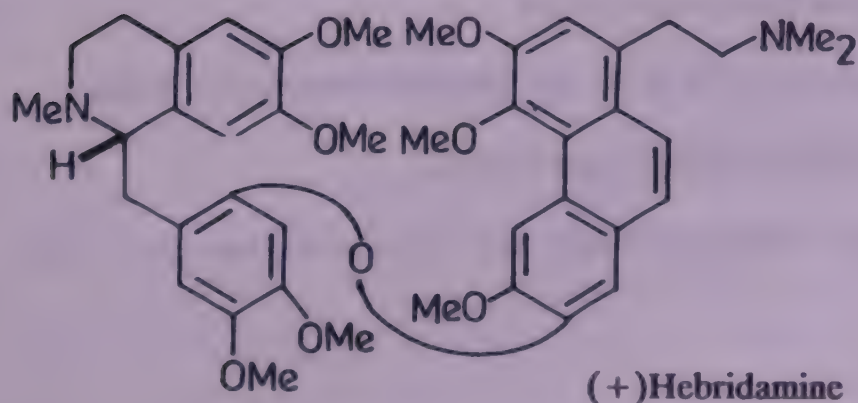


Ambriamine

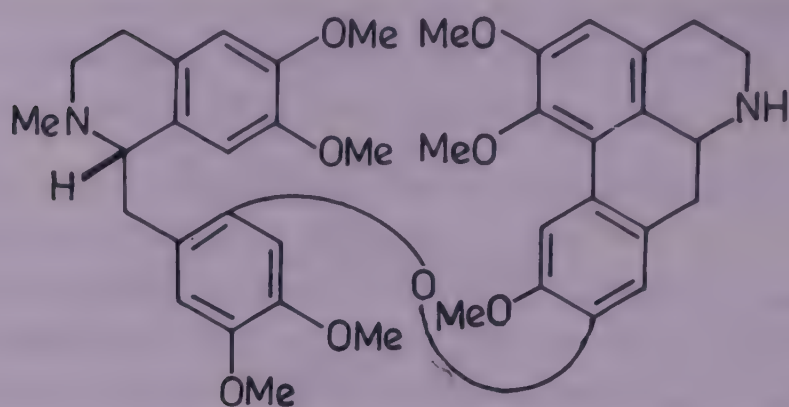
R = Me, R' = H

Efatine

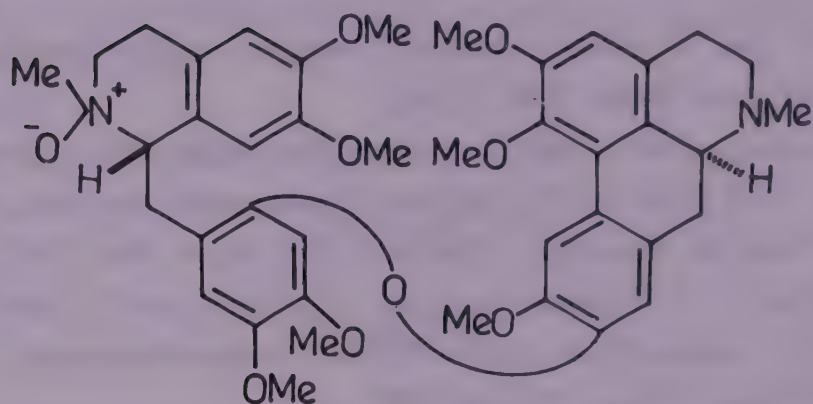
R = H, R' = Me



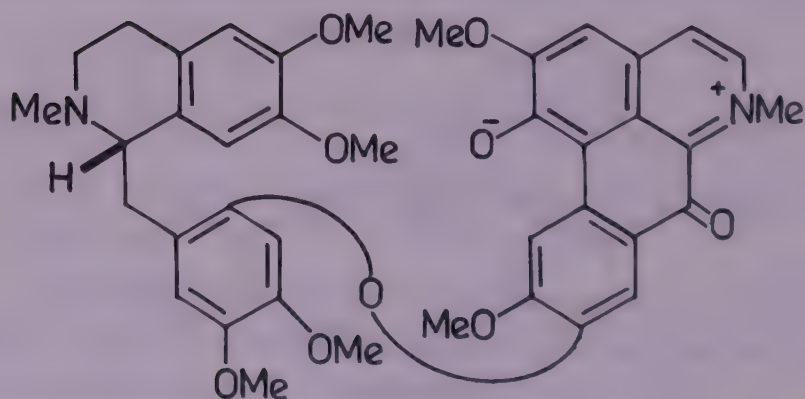
(+)Hebridamine



(+)6-Northallicarpine



(+)Thallicarpine 2'-N-oxide



(+)Vilaportine

H. peltata Meissn.; see *H. ovigera* L.

HERPESTIS (Scrophulariaceae)

H. monniera (L.) H.B. & K.; see *Bacopa monnieri* (L.) Wettst.

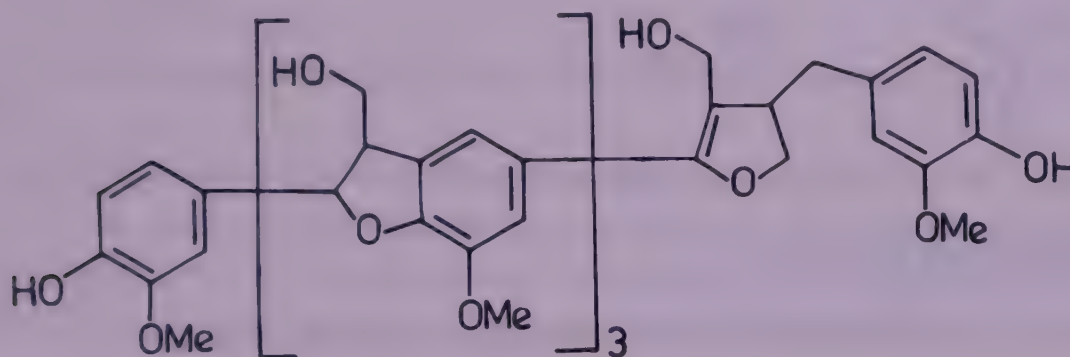
HERPETOSPERMUM (Cucurbitaceae)

H. caudigerum Wall. ex Clarke; see *H. pedunculatum* (Ser.) Baill.

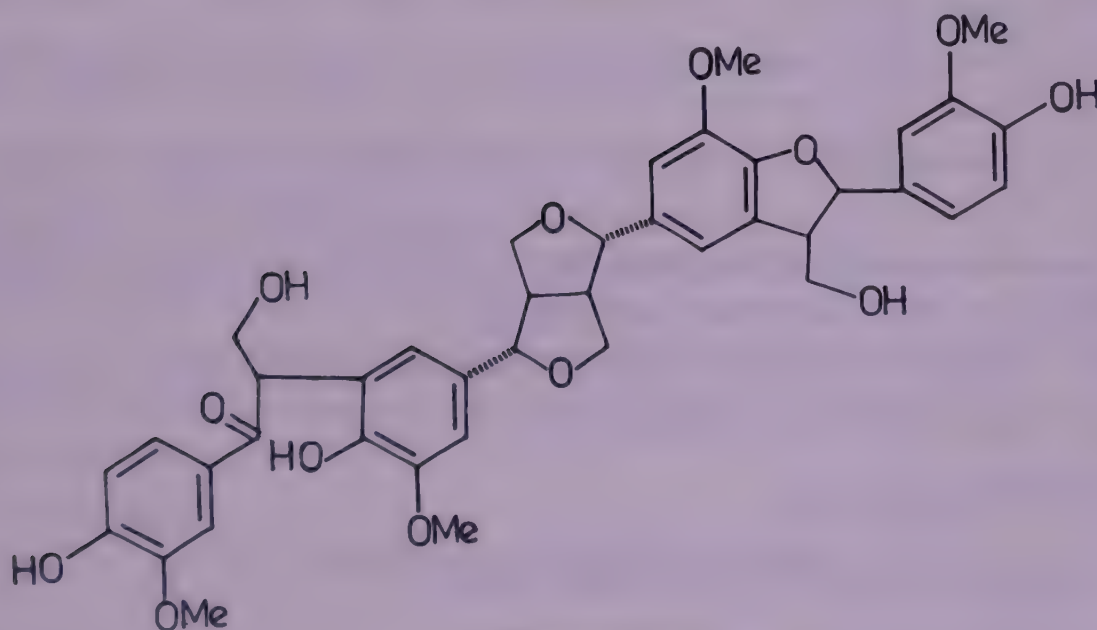
H. pedunculatum (Ser.) Baill. syn. *H. caudigerum* Wall. ex Clarke (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 341).

Isolation and characterisation of a new lignoid tetramer - herpetetradione - from seeds (*Tetrahedron Lett.* 1984, 25, 5135); a new lignoid pentamer - herpepentol - isolated from seeds and its structure determined (*Tetrahedron Lett.* 1984, 25, 5137); isolation of another new tetrameric lignoid - herpetetrone - from seeds and its structure elucidation (*J. Nat. Prod.* 1987, 50, 1089).

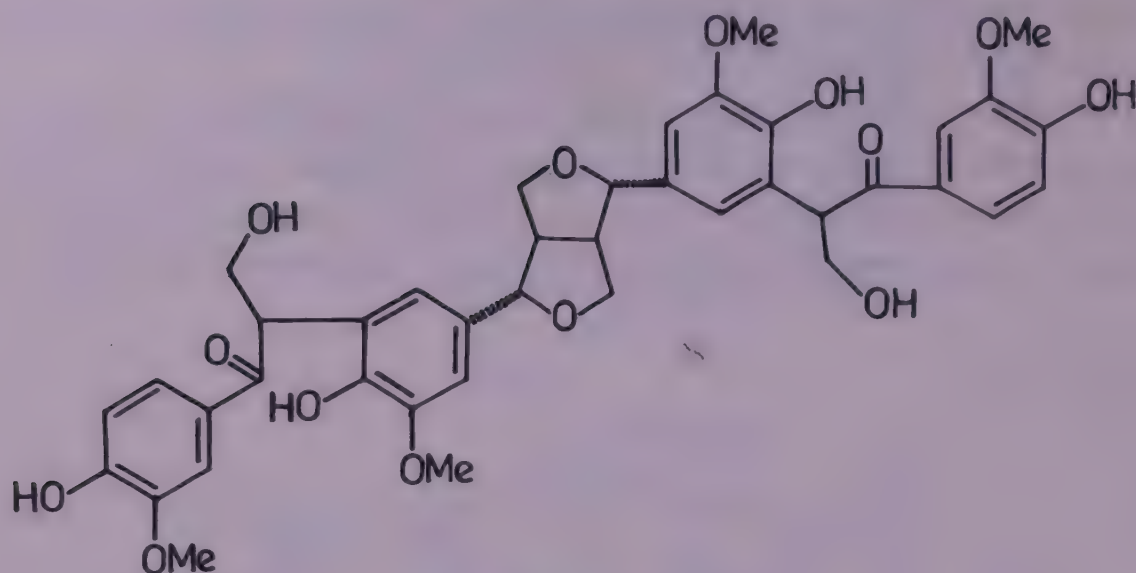
NEW COMPOUNDS



Herpepentol



Herpetetrone



Herpetetradione

HESPERETHUSA (Rutaceae)

H. crenulata (Roxb.) M. Roem.; see *Naringi crenulata* (Roxb.) Nicolson

HETEROPANAX (Araliaceae)

H. fragrans (Roxb.) Seem.

H. - Tarla; B. - Gutisuna; Assam - Keseru, Koronda, Karangiya; Nep. - Lal totilla; Mundari - Rengebanam.

Isolation and characterisation of lup-3 β ,23-dihydroxy-20(29)-en-27,28-dioic acid and melaleucic acid-28-[α -L-rhamnopyranosyl(1 \rightarrow 4)- β -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranosyl] ester from roots; oleanolic acid, daucosterol and melaleucic acid also isolated (*Yunnan Zhiwu Yanjiu* 1988, 10, 457; *Chem. Abstr.* 1989, 111, 54151 d).

Distribution : Foothills of Himalayas, Kumaon eastwards, alt. 400-1000 m, Bihar, Bengal, Assam and Andaman Islands.

HETEROPAPPUS (Asteraceae)

H. altaicus (Willd.) Novopkr.; see *Aster altaicus* Willd.

HETEROPHRAGMA (Bignoniaceae)

H. quadriloculare (Roxb.) Schum. syn. *H. roxburghii* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 342).

Arginine, cystine, lysine, tyrosine, glycine, proline, leucine, isoleucine, aspartic acid, lactose, glucose, fructose, rhamnose, galactose, xylose, ribose and arabinose isolated from seeds (*Acta Cienc. Indica, Chem.* 1984, 10, 35; *Chem. Abstr.* 1985, 103, 119970 b).

H. roxburghii DC.; see *H. quadriloculare* (Roxb.) Schum.

HEYLANDIA (Papilionaceae)

H. latebrosa DC.; see *Goniogyna hirta* (Willd.) Ali

HEYNEA (Meliaceae)

H. trijuga Roxb. ex Sims; see *Trichilia connaroides* (Wt. & Arn.) Benth

HIBISCUS (Malvaceae)

H. cannabinus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 343).

The phospholipid fraction from seeds contained phosphatidylcholine (39.2), phosphatidylinositol (30.4), phosphatidylethanolamine (16.0), N-acylphosphatidylethanolamine (9.6), lysophosphatidylcholine (0.8), lysophosphatidylinositol (0.8%) and N-acyllysophosphatidylethanolamine (*Khim. Prir. Soedin.* 1986, 558; *Chem. Abstr.* 1987, 106, 172892 r).

H. esculentus L.; see *Abelmoschus esculentus* (L.) Moench.

H. rosa-sinensis L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 370).

Flower extract at an oral dose of 0.27 g/kg showed 60.0% antifertility effect in rats whereas born foetuses showed some neonatal defects. It also caused 70.0% reduction in weight of foetuses (*Arogya* 1986, 12, 86).

Isolation and synthesis of 8-nonynoic and 9-decynoic acids and their methyl esters (*Phytochemistry* 1985, 24, 39); four new aliphatic esters - methyl 10-oxo-11-octadecynoate (I), methyl 8-oxo-9-octadecynoate (II), methyl 9-methylene-8-oxoheptadecanoate (III) and methyl 10-methylene-9-oxo-octadecanoate (IV) - isolated from stem bark and characterised (*Phytochemistry* 1986, 25, 449).

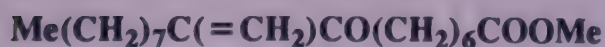
NEW COMPOUNDS



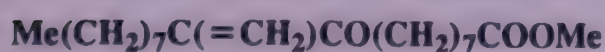
I



II



III



IV

BIOLOGICAL ACTIVITY

8-Nonynoic and 9-decynoic acids and their methyl esters inhibited germination of lettuce seeds (*Phytochemistry* 1985, 24, 39).

H. syriacus L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 371).

Seed oil exhibited antiseptic activity against human pathogenic bacteria and phytopathogenic fungi (*Fitoterapia* 1988, 59, 126).

Phenylethyl isopentenyl ether, a component of essential oil, synthesised (*Khim. Priro. Soedin.* 1985, 269; *Chem. Abstr.* 1985, 103, 141719 y); hibiscus mucilage SL from leaves composed mainly of rhamnose, galactose, galacturonic acid and glucuronic acid in molar ratio of 8.0:1.1:8.0:4.0 respectively (*Chem. Pharm. Bull.* 1986, 34, 4133); isolation of 3-O-malonylglucosides of delphinidin, cyanidin, petunidin, pelargonidin, peonidin and malvidin from petals (*Phytochemistry* 1989, 28, 1503).

HIPPOCRATEA (Hippocrateaceae)

H. indica Willd.; see *Reissantia indica* (Willd.) Halle

HIPPOPHAE (Elaeagnaceae)

H. rhamnoides L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 345).

Seed oil (2.5 ml/kg) showed significant protective effect against acetic acid-induced chronic gastric ulcer in rats and mice (*J. Med. Coll. PLA* 1988, 3, 87; *Chem. Abstr.* 1988, 109, 163256 w); total flavone fraction from fruits stimulated immune function in mice, increased T-lymphocytes and spleen rosette-forming cells (SRFC) and inhibited cyclophosphamide-induced decrease of SRFC. *In vitro* proliferation of spleen lymphocytes was promoted by low concentration but inhibited by high concentration of flavone fraction (*Zhongcaoyao* 1989, 20, 331; *Chem. Abstr.* 1989, 111, 187096 m).

Isolation of gnaphaloside A, gnaphaloside B, quercetin, isorhamnetin, rutin and luteolin from rhizomes and roots (*Farmatsiya* 1986, 35, 46; *Chem. Abstr.* 1986, 105, 102403 n); a new tannin - hiporhamnin - isolated from leaves and characterised as 6-O-galloyl-1,3-O-hexahydroxyphenyl- β -D-glucose; strictinin, isostrictinin and gallic acid also isolated (*Khim. Priro. Soedin.* 1987, 902; *Chem. Abstr.* 1988, 108, 183659 n); gallic, caffeic, p-coumaric, sinapic, ferulic, ellagic and chlorogenic acids identified (*Herba Pol.* 1988, 34, 115; *Chem. Abstr.* 1989, 111, 211980 t); alkaline hydrolysis of acylated β -sitosterol- β -D-glucoside, isolated from seed oil, yielded β -sitosterol- β -D-glucoside and palmitic, stearic, oleic, linoleic, linolenic and eicosenoic acids (*J. Med. Coll. PLA* 1988, 3, 87; *Chem. Abstr.* 1988, 109, 163256 w).

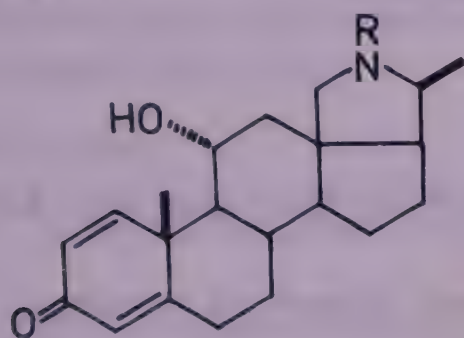
BIOLOGICAL ACTIVITY

β -Sitosterol- β -D-glucoside (12.0 mg/kg) showed significant protective effect against acetic acid-induced chronic gastric ulcer in rats and mice (*J. Med. Coll. PLA* 1988, 3, 87; *Chem. Abstr.* 1988, 109, 163256 w).

HOLARRHENA (Apocynaceae)

H. antidysenterica (Roth) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 345).

Three new steroidal alkaloids - regholarrhenines A, B and C - isolated from bark of flowering plant and their structures elucidated (*Phytochemistry* 1988, 27, 925).

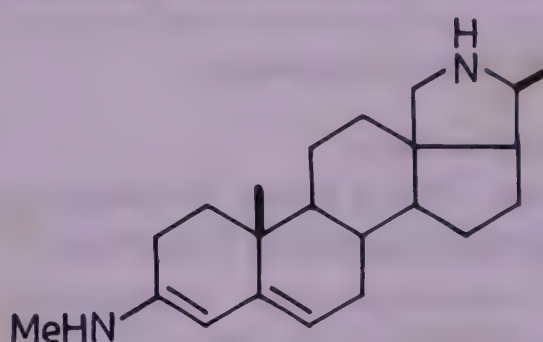
NEW COMPOUNDS

Regholarrhenine A

R = Me

Regholarrhenine B

R = H



Regholarrhenine C

HOLMSKIOLDIA (Verbenaceae)

H. sanguinea Retz. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 346).

Isolation and structure determination of 6-O-feruloylscutellarein and luteolinidin-4'-glucuronide from flowers; scutellarein and oroxindin also isolated (*Indian J. Chem.* 1985, 24B, 323); oroxylin A, wogonin, oroxindin and sitosterol from leaves (*Indian J. Chem.* 1985, 24B, 323; *Curr. Sci.* 1986, 55, 402).

HOLOPTELEA (Ulmaceae)

H. integrifolia (Roxb.) Planch. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 375).

2-Aminonaphthaquinone (0.001), friedelin (0.002), epifriedelinol (0.005), β -sitosterol (0.004) and its β -D-glucoside (0.01%) isolated from stem bark (*J. Indian Chem. Soc.* 1986, 63, 448).

HOMALOMENA (Araceae)

H. aromatica (Roxb.) Schott (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 135).

Linalool identified as major constituent in rhizome essential oil (*Flavour Fragrance J.* 1988, 3, 179; *Chem. Abstr.* 1989, 111, 28397 u).

HOMONOIA (Euphorbiaceae)

H. reparia Lour. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 135).

Quercetin-3-O- β -D-glucopyranosyl(1 \rightarrow 6)- α -L-rhamnoside, gallic acid and taraxerone isolated from leaves (*J. Indian Chem. Soc.* 1988, 65, 815).

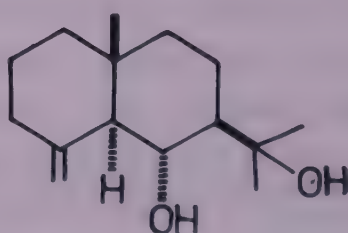
HOPEA (Dipterocarpaceae)

H. parviflora Bedd.

Kan. - Tirupu, Bovige, Kiralbhogi, Bovumara; Mal. - Thambagam; Tam. - Kongu, Vellai, Pongu, Agil, Irumbugam; Trade - Hopea.

A new sesquiterpene - 6 α -hydroxy- β -eudesmol - isolated and its structure determined (*Indian Drugs* 1984, 21, 515).

Distribution : Western Ghat, north Kanara southwards.

NEW COMPOUNDS

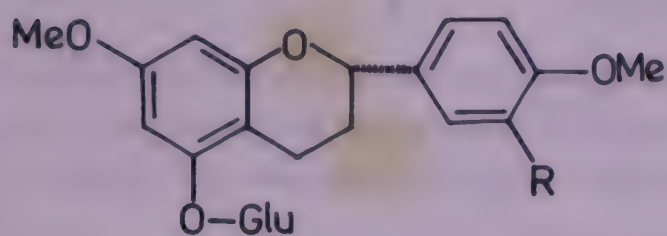
6 α -Hydroxy- β -eudesmol

HOPPEA (Gentianaceae)

H. dichotoma Hayne ex Willd. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 375).

Isolation and structure determination of two new glucosyloxyflavans - dichotosin and dichotosinin - from roots collected before flowering of plant; diffutin also isolated (*Phytochemistry* 1985, 24, 831).

NEW COMPOUNDS



Dichotosinin

R = OMe

Dichotosin

R = H

BIOLOGICAL ACTIVITY

Dichotosin and dichotosinin showed varying degrees of adaptogenic activity in mice and rats (*Phytochemistry* 1985, 24, 831).

HORDEUM (Poaceae)

H. vulgare L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 347).

Glucan showed antitumor activity against sarcoma 180 in mice (*Dtsch. Apoth. Ztg.* 1988, 128, 1305; *Chem. Abstr.* 1988, 109, 104168 w).

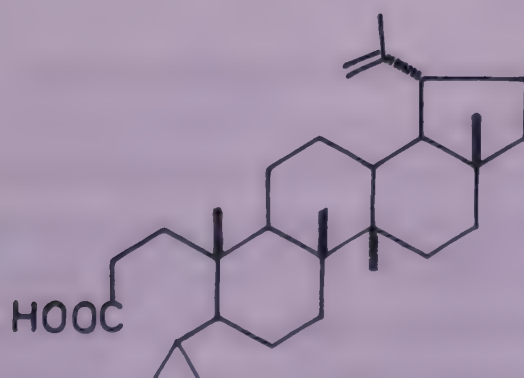
HOYA (Asclepiadaceae)

H. parasitica (Roxb.) Wall.

Isolation and characterisation of 3,4-seco-lup-20(29)-en-3-oic acid from stem; lupeol and lupenone also isolated (*J. Indian Chem. Soc.* 1986, 63, 782).

Distribution : Assam, Meghalaya, Tripura, ascending to 600 m, Sundarbans and Andaman Islands.

NEW COMPOUNDS



3,4-Seco-lup-20(29)-en-3-oic acid

HUGONIA (Linaceae)

H. mystax L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 136).

Root extract showed pronounced anti-inflammatory, ulcerogenic and mild analgesic activities in male albino rats and mice (*Arogya* 1989, 15, 148).

HUMULUS (Moraceae)

H. lupulus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 347).

6-Isopentenylnaringenin (sophoraflavanone B), xanthohumol and isoxanthohumol isolated from hard resin (*Agric. Biol. Chem.* 1984, 48, 2771); caryophylla-4(12),8(13)-dien-5 β -ol, caryophylla-3,8(13)-dien-5 α -ol and caryophylla-3,8(13)-dien-5 β -ol identified in oil (*Agric. Biol. Chem.* 1986, 50, 1903).

BIOLOGICAL ACTIVITY

6-Isopentenylnaringenin, xanthohumol and isoxanthohumol showed antimicrobial activity against *Trichophyton mentagrophytes*, *T. rubrum*, *Staphylococcus aureus* and *Escherichia coli* (*Agric. Biol. Chem.* 1984, 48, 2771).

HUNTERIA (Apocynaceae)

H. corymbosa Roxb.; see *H. zeylanica* (Retz.) Gardn. ex Thw.

H. legocii Livera; see *H. zeylanica* (Retz.) Gardn. ex Thw.

H. zeylanica (Retz.) Gardn. ex Thw. syn. *H. legocii* Livera, *H. corymbosa* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 348).

(+)Eburnamine and (-)eburnamenine synthesised (*J. Chem. Soc. Perkin 1* 1985, 305); synthesis of kopsinine (*Tetrahedron Lett.* 1987, 28, 3985).

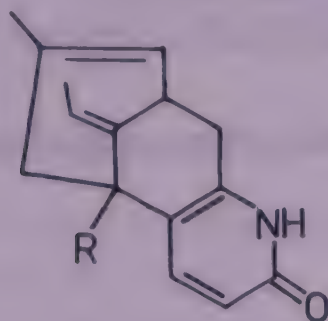
HUPERZIA (Lycopodiaceae)

H. serrata (Thunb.) Rothm. syn. *Lycopodium serratum* Thunb.

Two new alkaloids - huperzines A and B - isolated and their structures established (*Can. J. Chem.* 1986, 64, 837; *Yaoxue Xuebao* 1988, 23, 516; *Chem. Abstr.* 1989, 110, 92014 y); isolation of N-methylhuperzine B and 8-deoxyserratinine (*Zhongcaoyao* 1987, 18, 50; *Chem. Abstr.* 1987, 107, 93545 x; *Yaoxue Xuebao* 1988, 23, 516; *Chem. Abstr.* 1989, 110, 92014 y); isolation and characterisation of huperzine (Yaoxue Xuebao 1988, 23, 516; *Chem. Abstr.* 1989, 110, 92014 y); six terpenoids - serratenediol, its 3- and 21-acetates, 16-oxodiepiserratenediol, 21-episeratenediol and its 3-acetate isolated (*Yaoxue Xuebao* 1988, 23, 549; *Chem. Abstr.* 1989, 110, 92015 z).

Distribution : West Bengal, Sikkim eastwards and Tamil Nadu.

NEW COMPOUNDS

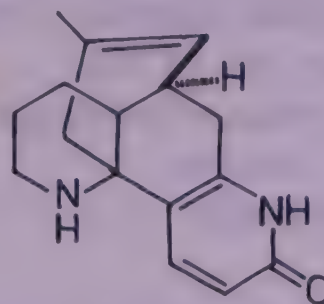


Huperzine A

R = NH₂

Huperzine B

R = NMe₂



Huperzine B

BIOLOGICAL ACTIVITY

Huperzines A and B exhibited strong anticholinesterase activity and also increased learning ability and memory (*Acta Phamacol. Sin.* 1986, 7, 109).

HYDNOCARPUS (Flacourtiaceae)

H. laurifolia (Dennst.) Sleummer; see *H. pentandra* (Buch.-Ham.) Oken

H. pentandra (Buch.-Ham.) Oken syn. *H. laurifolia* (Dennst.) Sleummer, *H. wightiana* Blume (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 349).

Two new cyclopentenoid cyanohydrin glycosides - (1S,4R) and (1R,4S) 1-[6-O(α -L-rhamnopyranosyl)- β -D-glucopyranosyloxy]-4-hydroxy-2-cyclopentene-1-carbonitrile - isolated from seeds and their structures elucidated; epivolkenin and taraktophyllin also present in small amounts (*Planta Med.* 1988, 54, 333).

H. wightiana Blume; see *H. pentandra* (Buch.-Ham.) Oken

HYDROCOTYLE (Apiaceae)

H. asiatica L., see *Centella asiatica* (L.) Urban

H. rotundifolia Roxb.; see *H. sibthorpioides* Lamk.

H. sibthorpioides Lamk. syn. *H. rotundifolia* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 351).

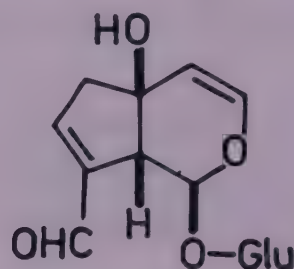
(-)-Sesamin isolated (*Planta Med.* 1987, 53, 228).

HYGROPHILA (Acanthaceae)

H. difformis (L.f.) Blume syn. *Cardanthera triflora* Buch.-Ham. ex Benth.

A new iridoid glucoside - hygrophiloside - isolated and its structure determined (*Phytochemistry* 1985, 24, 602).

Distribution : Plains of West Bengal and Assam, along water courses, bank of ponds and wet situations.

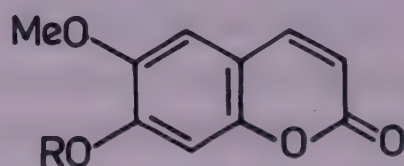
NEW COMPOUNDS

Hygrophiloside

HYMENODICTYON (Rubiaceae)

H. excelsum (Roxb.) Wall. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 382).

Hymexelsin isolated from stem bark and characterised as apioglucoside of scopoletin (*J. Nat. Prod.* 1988, 51, 959).

NEW COMPOUNDS

Hymexelsin

R = Glu(6→1)Apiose

HYOSCYAMUS (Solanaceae)

H. albus L.

A new compound - 2,3-dimethylnonacosane - isolated from leaves and stems along with hyoscine and hyoscyamine (*Phytochemistry* 1985, 24, 1618).

Distribution : Grown by Central Institute of Aromatic and Medicinal Plants, Lucknow, in its experimental farm.

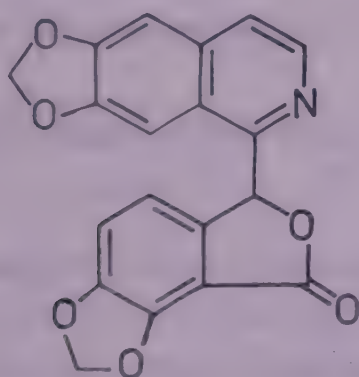
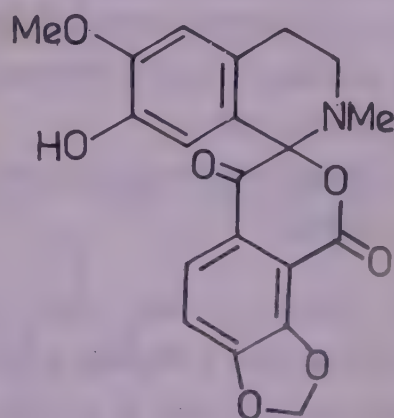
H. pusillus L.

Hyoscyne, hyoscyamine, apohyoscyne, apoatropine and tropine identified in total alkaloids (0.09%) from aerial parts (*Khim. Pri. Soedin.* 1985, 274; *Chem. Abstr.* 1985, 103, 34908 n).
Distribution : Ladakh.

HYPECOUM (Papaveraceae)

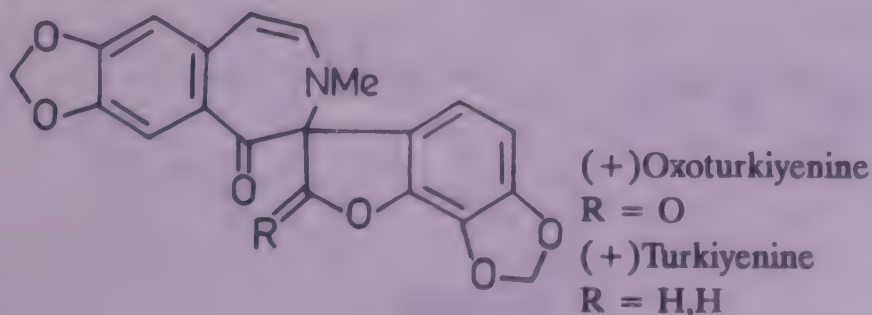
H. leptocarpum Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 221).

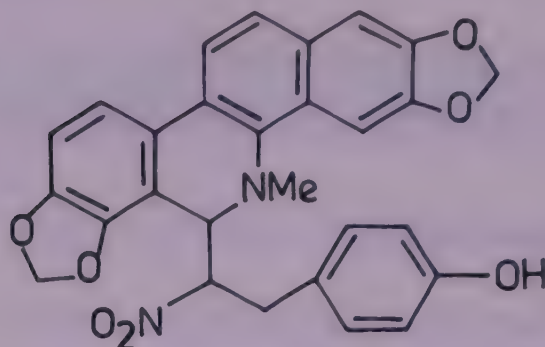
Isolation of a new alkaloid - hypecoumine - along with protopine, cryptopine and oxyhydrastinine and its structure determination (*Yaoxue Xuebao* 1985, 20, 658; *Chem. Abstr.* 1986, 104, 65907 m); a new seco-berberine alkaloid - procumbine - isolated along with allocryptopine, protopine, corydine, isocorydine, sanguinarine, chelerythrine, coptisine, magnoflorine and (-)-trans-N-methylstylopinium hydroxide (*Collect. Czech. Chem. Commun.* 1987, 52, 508); structure of procumbine determined (*Heterocycles* 1988, 27, 39).

NEW COMPOUNDS**Hypecoumine****Procumbine**

H. pendulum L. syn. *H. procumbens* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 352).

Isolation and structure elucidation of (+)oxoturkiyenine and (+)turkiyenine (*J. Am. Chem. Soc.* 1984, 106, 6101; *J. Nat. Prod.* 1988, 51, 272); a new benzophenanthridine alkaloid - nitrotyrasanguinarine - isolated from Turkish plant and its structure determined (*J. Nat. Prod.* 1989, 52, 716).

NEW COMPOUNDS



Nitrotyrasanguinarine

H. procumbens L.; see *H. pendulum* L.

HYPERICUM (Hypericaceae)

H. chinense L.; see *H. monogynum* Miller ex L.

H. elodeoides Choisy

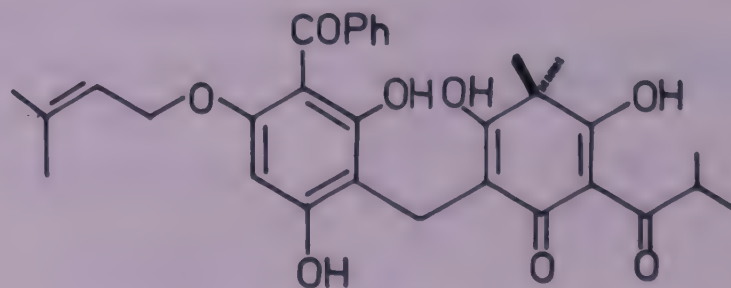
Alloaromadendrene, bergamotene, β -bisabolene, β -bisabolol, calamenene, caryophyllene, cedrol, α -curcumene, elemol, β -farnesene, farnesol, 7-hydroxycalamenene, limonene, γ -muurolene, nonane, α - and β -pinenes identified in oil of aerial parts by GC-MS (*J. Indian Chem. Soc.* 1984, 61, 792).

Distribution : Himalayas, from Kashmir to Sikkim, alt. 2100-3600 m, Khasia Hills, alt. 1200-1800 m.

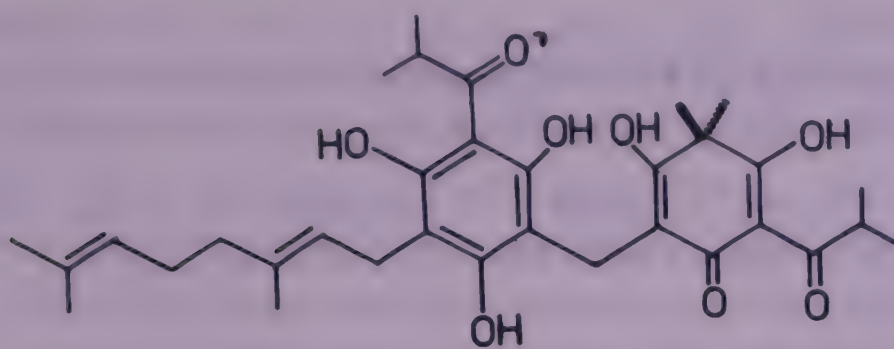
H. japonicum Thunb. ex Murr. syn. *Triadenum japonicum* (Blume) Makino (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 352).

Sarothralin isolated and its crystal structure determined (*Chem. Commun.* 1985, 26); isolation of betulinic acid, quercetin, (+)catechin, avicularin and hyperin from flowering plant (*Khim. Pri. Soedin.* 1986, 376; *Chem. Abstr.* 1986, 105, 112088 c); two antibiotic compounds - sarothralen A and sarothralen B - isolated and their structures elucidated (*Planta Med.* 1986, 52, 288); isolation and characterisation of saroaspidins A, B and C (*Planta Med.* 1987, 53, 415); four new acylphloroglucinols - japonicins A, B, C and D - isolated and their structures determined; japonicins B and C found to be identical with sarothralen B and sarothralin respectively (*Huaxue Xuebao* 1986, 46, 246; *Chem. Abstr.* 1988, 109, 66369 c).

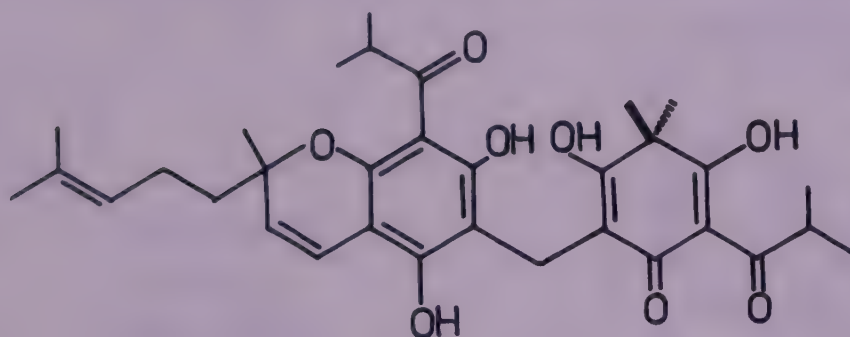
NEW COMPOUNDS



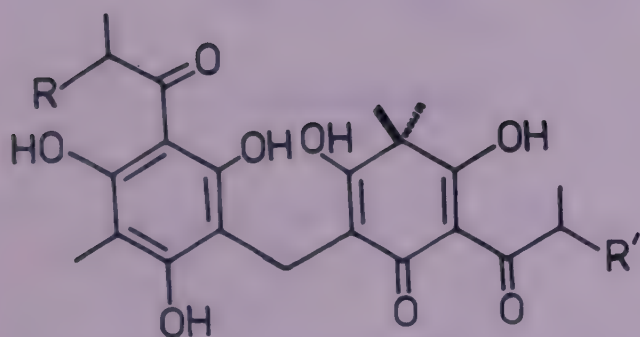
Sarothralin



Sarothralen A



Sarothralen B



Saroaspidin A

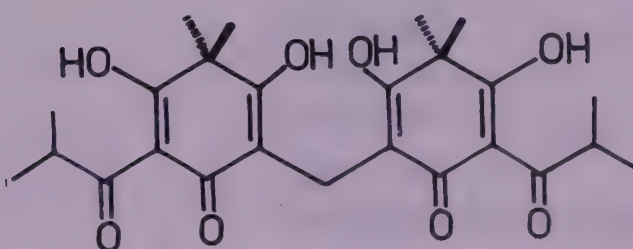
$R, R' = H$

Saroaspidin B

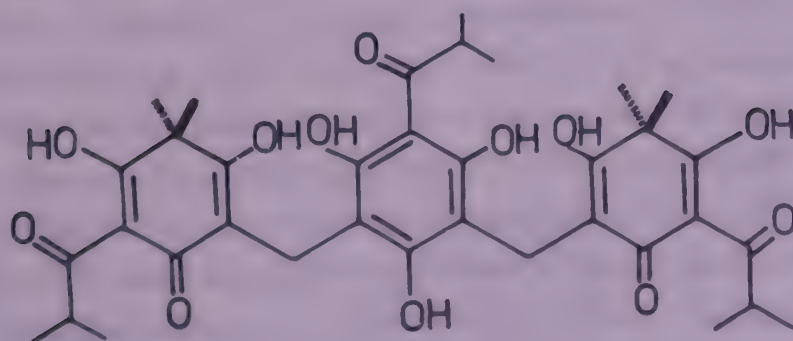
$R = H, R' = Me$

Saroaspidin C

$R, R' = Me$



Japonicin A



Japonicin D

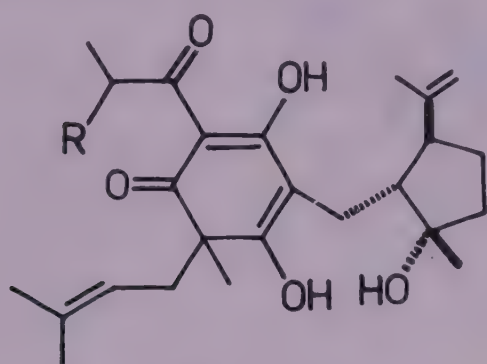
BIOLOGICAL ACTIVITY

Japonicin A and japonicin B (sarthrolen B) showed antimalarial activity *in vivo* against *Plasmodium berghei* in mice (Huaxue Xuebao 1988, 46, 246; Chem. Abstr. 1988, 109, 66369 c).

H. monogynum Miller ex L. syn. *H. chinense* L., *H. salicifolium* Sieb. & Zucc. (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 138).

Isolation and structure elucidation of chinesin I and chinesin II from flowers (Chem. Lett. 1987, 1337; Chem. Abstr. 1987, 107, 151213 a); a new spiro compound - hyperolactone - isolated from stems and leaves and its structure determined by 2D-NMR (Chem. Lett. 1989, 683; Chem. Abstr. 1989, 111, 74796 w).

NEW COMPOUNDS

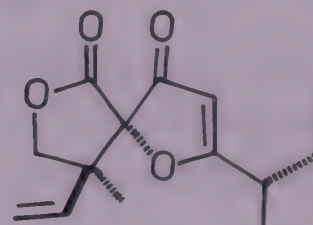


Chinesin I

R = Et

Chinesin II

R = Me



Hyperolactone

BIOLOGICAL ACTIVITY

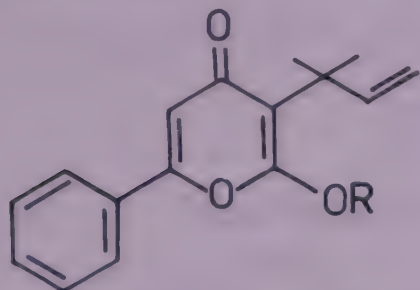
Chinesin I and chinesin II were active against Gram-positive bacteria; chinesin I also exhibited cytotoxic activity in HeLa cells (Chem. Lett. 1987, 1337; Chem. Abstr. 1987, 107, 151213 a).

H. mysorens Wight & Arn. (*mysorens*) (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 353).

Hyperenone A, mysorenone A and methyl phenacyl 1,1-dimethylprop-2-enylmalonate (I) isolated and their structures established; 2-hydroxy-, 2-methoxy-, 1,7-dihydroxy- and 2,3-dimethoxy-xanthenes also isolated (Chem. Pharm. Bull. 1985, 33, 557); hyperenone B and mysorenones B and C from Sri Lankan plant and their characterisation; hyperenones A and B synthesised (Chem. Pharm. Bull. 1985, 33, 1969); two new pyrones isolated from aerial parts and characterised as 3-(1,1-dimethyl-2-propenyl)-6-phenyl-3H-pyran-2,4-dione (II) and 3-(1,1-dimethyl-2-propenyl)-2-methoxy-6-phenyl-4H-pyran-4-one (III) (Indian J. Chem. 1986, 25B, 466); isolation and structure determination of a xanthonolignoid - hypericorin (Indian J. Chem. 1986, 25B, 1155); two new lactones - 3-(1,1-dimethyl-2-propenyl)-4-(3,3-

dimethyl-3-hydroxy-1-oxopropoxy)-6-phenyl-2H-pyran-2-one (IV) and 3-(3,3-dimethyl-2-propenyl)-4-methoxy-5-phenyl-2(5H)-furanone (V) - isolated and their structures determined (*Indian J. Chem.* 1987, 26B, 486); isolation, structure and synthesis of 2,3-methylenedioxyxanthone; 1,2-dimethoxy-, 1,5-dihydroxy-3-methoxy-, 3-hydroxy-2-methoxy- and 6,7-dimethoxy-1-hydroxy-xanthenes also isolated (*Indian J. Chem.* 1988, 27B, 385).

NEW COMPOUNDS

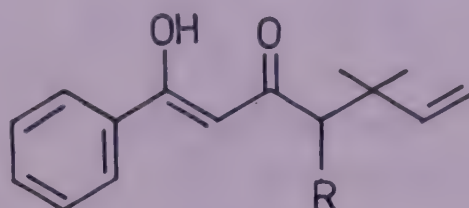


Hyperenone A

R = Me

Hyperenone B

R = H

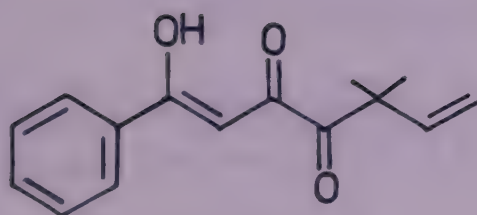


Mysorenone A

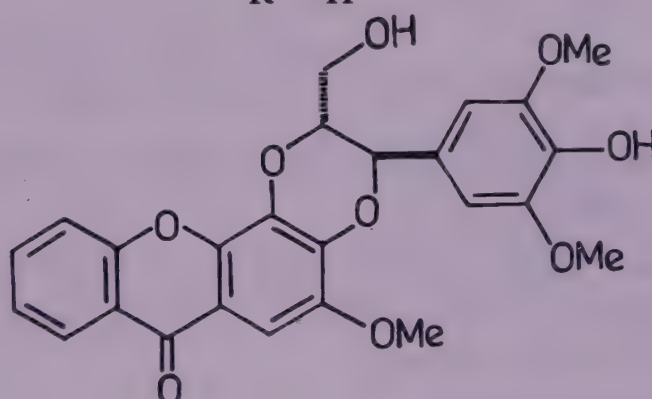
R = COOMe

Mysorenone B

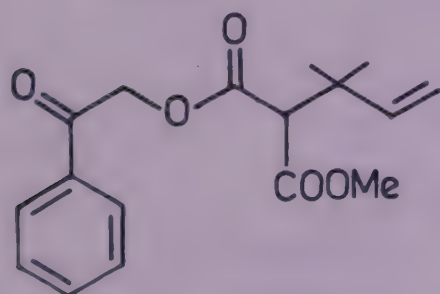
R = H



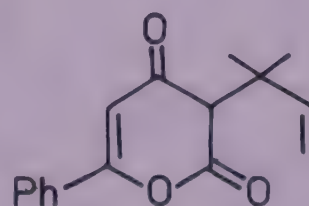
Mysorenone C



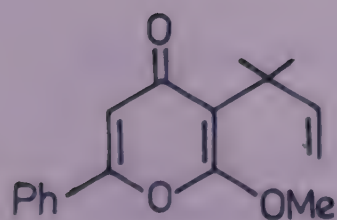
Hypericorin



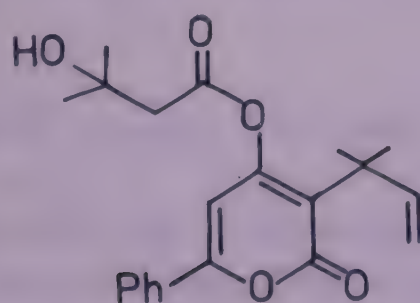
I



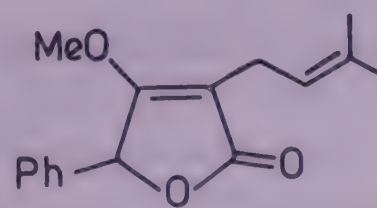
II



III



IV

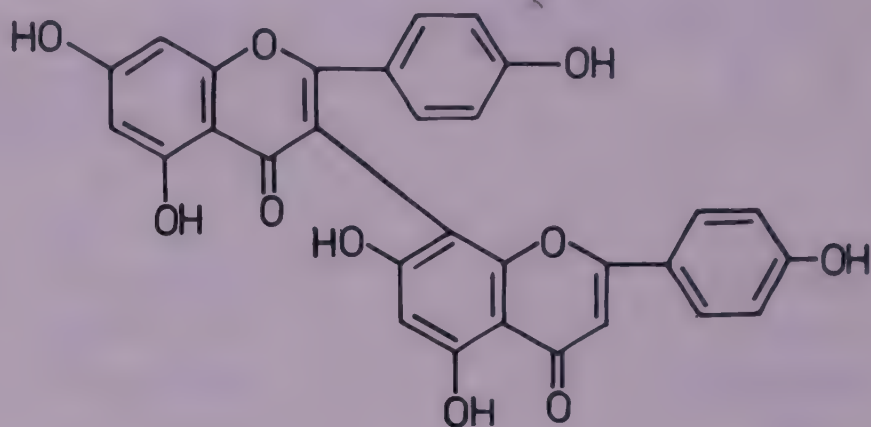


V

H. perforatum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 353).

Identification of rutin, hyperoside and isoquercitrin by TLC (*Pharmazie* 1985, 40, 585; *Chem. Abstr.* 1986, 104, 3434 w); isolation of 3,8''-biapigenin and its structure elucidation (*Planta Med.* 1987, 53, 216); amentoflavone isolated as minor component (*Planta Med.* 1989, 55, 91).

NEW COMPOUNDS



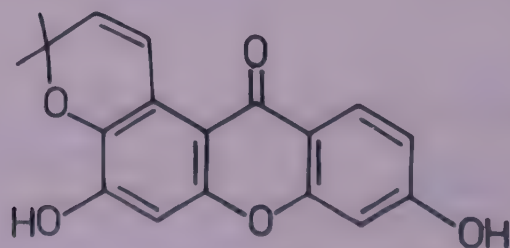
3,8''-Biapigenin

H. salicifolium Sieb. & Zucc.; see *H. monogynum* Miller ex L.

H. sampsonii Hance (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 139).

A new xanthone - hyperxanthone - isolated and its structure established; mangiferin, isomangiferin, toxyloxanthone B and 2-hydroxy-3,4-dimethoxyxanthone also isolated (*Heterocycles* 1985, 23, 2543).

NEW COMPOUNDS



Hyperxanthone

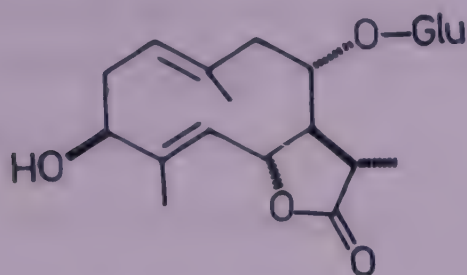
HYPOCHOERIS (Asteraceae)

H. radicata L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 354).

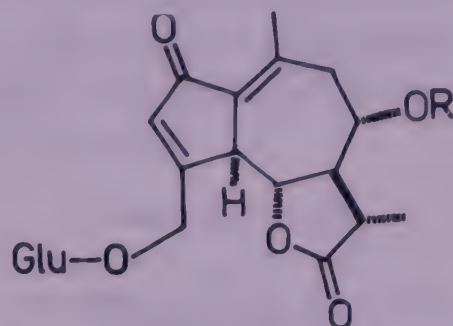
A new germacrane glucoside - hypochoeroside A - and eight new guaiane glucosides - hypochoerosides B, C, D, E, F, G, H and I - together with three new eudesmane glucosides -

hypochoerosides J, K and L - and a new phenylbutanoid glucoside (I) isolated and their structures elucidated (*Phytochemistry* 1989, 28, 1919).

NEW COMPOUNDS

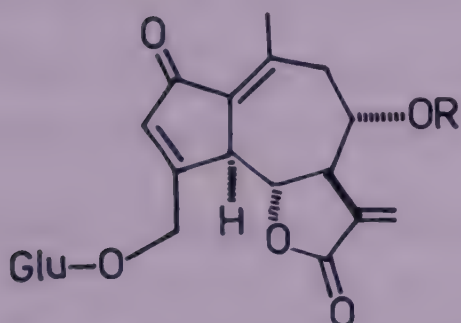


Hypochoeroside A



Hypochoeroside B

R = Methacryloyl

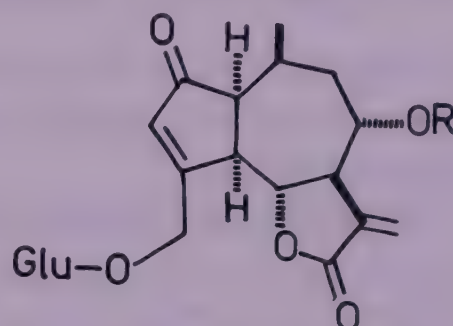


Hypochoeroside C

R = Methacryloyl

Hypochoeroside D

R = Cinnamoyl

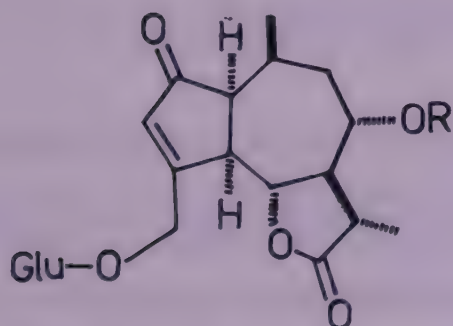


Hypochoeroside E

R = Methacryloyl

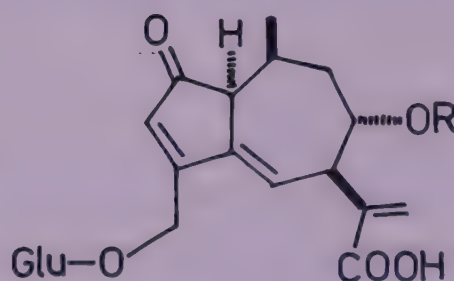
Hypochoeroside F

R = Cinnamoyl



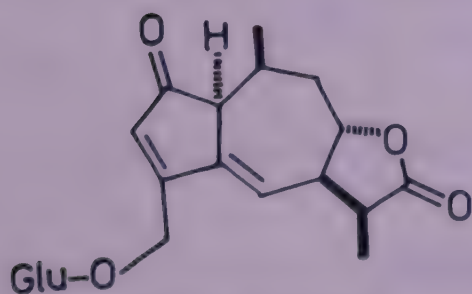
Hypochoeroside G

R = Methacryloyl

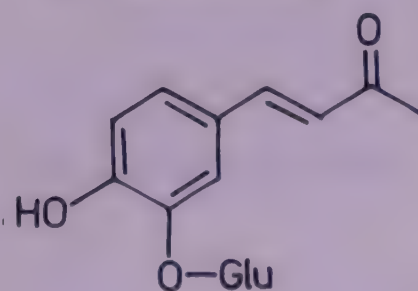


Hypochoeroside H

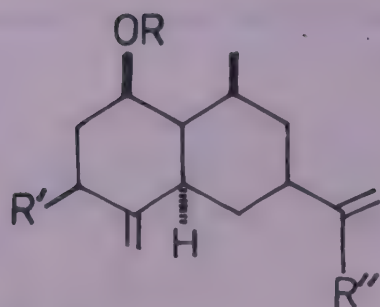
R = Methacryloyl



Hypochoeroside I



I

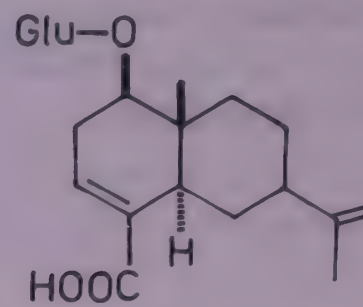


Hypochoeroside J

R = Glu, R' = H, R'' = COOH

Hypochoeroside K

R = H, R' = OH, R'' = Me



Hypochoeroside L

HYPODEMATIUM (Hypodemataceae)

H. crenatum (Forsk.) Kuhn syn. *Lastrea crenata* (Forsk.) Bedd., *L. eriocarpa* Presl, *Dryopteris crenata* (Forsk.) Ktze. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 354).

Mangiferin, iriflophenone-3-C- β -D-glucoside and kaempferol-3-O- β -D-glucoside isolated (*Yakugaku Zasshi* 1986, 106, 378; *Chem. Abstr.* 1986, 105, 168852 q).

HYPOXIS (Amaryllidaceae).

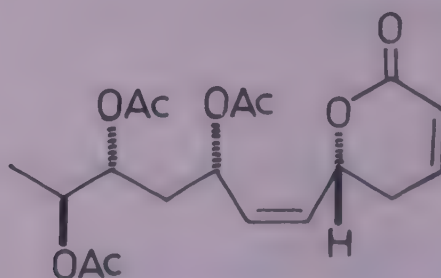
H. orchoides Kurz; see *Curculigo orchoides* Gaertn.

HYPTIS (Lamiaceae)

H. pectinata (L.) Poit. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 139).

A new lactone - hyptolide - isolated and its crystal structure determined as 6R-(1Z,3S,5R,6S)5,6-dihydro-6[3,5,6-tris(acetoxy)-1-heptenyl]-2H-pyran-2-one (*Acta Chem. Scand.* 1987, 41B, 599); detection of p-cymene, myrcene, γ -terpinene, α -thujene and thymol in essential oil of leaves of West African plant (*Planta Med.* 1988, 54, 531).

NEW COMPOUNDS



Hyptolide

H. suaveolens (L.) Poit. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 354).

Hentriacontane, hentriacontanone, lupeol and its acetate and friedelin isolated from leaves and floral parts (*Indian Drugs* 1984, 21, 423); β -caryophyllene (41.0), α -bergamotene, 1,8-cineole, α -copaene, sabinene and terpinen-4-ol identified in oil from aerial parts of South American plant (*Pertanika* 1988, 11, 239; *Chem. Abstr.* 1989, 110, 92121 f).

HYSSOPUS (Lamiaceae)

H. officinalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 355).

Pinocamphone (69.1), β -pinene (16.8), camphene (11.5) and pinocampheol (1.1%) identified in essential oil (1.0-1.5%) of aerial parts by GC (*Parfuem. Kosmet.* 1986, 67, 116; *Chem. Abstr.* 1986, 104, 212998 x).

ICHNOCARPUS (Apocynaceae)

I. frutescens (L.) R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 355).

α -Amyrin and its acetate, lupeol and its acetate, friedelin, epifriedelinol and β -sitosterol isolated from stems (*Indian Drugs* 1985, 22, 552); isolation of lup-12-enyl-3 β -palmitate, lupeol acetate, lup-12-enol, friedelin, friedelinol, oleanolic acid, nonane, 5-hydroxyoctacosan-25-one, dotriacontanoic acid, sitosterol and its palmitate (*Fitoterapia* 1987, 58, 271); quercetin and its 3-O- β -D-glucoside from flowers (*J. Indian Chem. Soc.* 1987, 64, 715); butyl- α -L-sorbo-pyranoside isolated together with kaempferol and its 3-glucoside (*Indian J. Chem.* 1988, 27B, 283).

IFLOGA (Asteraceae)

I. fontanesii Cass.; see *I. spicata* (Forsk.) Sch.-Bip.

I. spicata (Forsk.) Sch.-Bip. syn. *I. fontanesii* Cass.

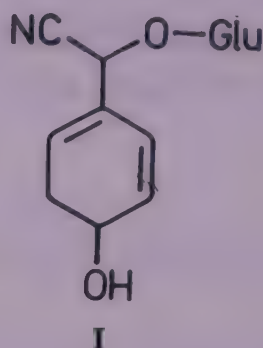
Anethole, benzoic acid, cycloartenol, obliquin, stigmasterol, β -sitosterol, p-hydroxy-acetophenone and prenyletin isolated (*Pharmazie* 1989, 44, 235; *Chem. Abstr.* 1989, 111, 54185 t).
Distribution : Punjab and western Uttar Pradesh, in plains.

ILEX (Aquifoliaceae)

I. aquifolium L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 356).

A novel cyanogenic glucoside - 2- β -D-glucopyranosyloxy-p-hydroxy-6,7-dihydromandelonitrile (I) - isolated from ripe fruits and its structure determined (*Phytochemistry* 1988, 27, 1852).

NEW COMPOUNDS



ILLICIUM (Illiciaceae)

I. simonsii Maxim.

Limonene (73.42%) identified as major component in volatile oil of dried fruits (*Zhongcaoyao* 1988, 19, 537; *Chem. Abstr.* 1989, 111, 74767 n).

Distribution : Assam, Manipur and Nagaland.

I. verum Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 356).

Detection of trans-anethole as major constituent in essential oils of fruits, fresh twigs and leaves by GC-MS (*Linchan Huaxue Yu Gongye* 1985, 5, 33; *Chem. Abstr.* 1986, 104, 3421 q).

ILLIGERA (Hernandiaceae)

I. khasiana Clarke

Actinodaphnine, β -sitosterol, n-tritriacontane, launobine and chrysophanol present in stem (*Zhiwu Xuebao* 1987, 29, 324; *Chem. Abstr.* 1987, 107, 151254 q).

Distribution : Khasia Hills in Meghalaya, ascending to 1200 m.

IMPATIENS (Balsaminaceae)

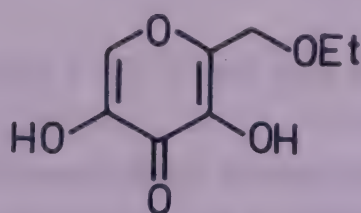
I. balsamina L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 357).

A new monoglyceride - (-)(R,Z)glycerol-1-octadec-9-enoate - isolated from seeds and characterised; palmitic, stearic and oleic acids and their ethyl ester also isolated (*J. Indian Chem. Soc.* 1988, 65, 367).

INCARVILLEA (Bignoniaceae)

I. arguta (Royle) Royle syn. *Amphicome arguta* Royle (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 357).

Isolation of argutone from seeds and its structure determination by X-ray analysis (*Yaoxue Xuebao* 1987, 22, 711; *Chem. Abstr.* 1988, 108, 43893 j).

NEW COMPOUNDS

Argutone

BIOLOGICAL ACTIVITY

Argutone exhibited bacteriostatic activity (*Yaoxue Xuebao* 1987, 22, 711; *Chem. Abstr.* 1988, 108, 43893 j).

INDIGOFERA (Papilionaceae)

I. mysorensis Rottl. ex DC.

Eng. - Mysore panicked indigo; Kan. - Kempu gogge.

Apigenin-7-rhamnoglucoside and -7,4'-diglucoside, kaempferol-3-neohesperidoside, protocatechuic acid and p-hydroxybenzoic acid isolated from leaves (*J. Indian Chem. Soc.* 1987, 64, 648).

Distribution : Karnataka in plains.

I. suffruticosa Mill. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 386).

A new compound isolated from roots and stems and characterised as 2,3,4,6-tetra(3-nitropropanoyl)- α -D-glucopyranose (*Phytochemistry* 1989, 28, 1251).

I. tinctoria L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 141).

A galactomannan, composed of galactose and mannose in molar ratio of 1:1.52, isolated from seeds and partially characterised (*Carbohydr. Res.* 1986, 157, 251; *Chem. Abstr.* 1987, 106, 81600 c).

INULA (Asteraceae)

I. cappa DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 358).

Lupeol, β -sitosterol and oleanolic, caprylic, lauric, myristic, palmitic, stearic, oleic and lignoceric acids isolated from bark (*Acta Cienc. Indica, Chem.* 1984, 10, 18; *Chem. Abstr.* 1985, 103, 102044 e).

I. graveolens Desf. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 361).

Crystal structure of graveolide determined (*Gazz. Chim. Ital.* 1986, 116, 637; *Chem. Abstr.* 1987, 107, 154539 x).

I. helenium L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 362).

Gnaphalosides A and B, quercetin, isorhamnetin, rutin and luteolin isolated from rhizomes and roots (*Farmatsiya* 1986, 35, 46; *Chem. Abstr.* 1986, 105, 102403 n); alantolactone and isoalantolactone identified in roots (*Izv. Akad. Nauk Az. SSR, Ser. Biol. Nauk* 1987, 93; *Chem. Abstr.* 1989, 110, 36755 d).

BIOLOGICAL ACTIVITY

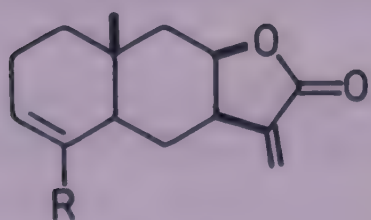
Alantolactone and isoalantolactone at a dose of 100.0-200.0 mg/kg shown to be more effective antioxidants than α -tocopherol in mice (*Khim. Pri. Soedin.* 1987, 752; *Chem. Abstr.* 1988, 108, 88031 t).

I. indica L.; see *Pentanema indicum* (L.) Ling

I. racemosa Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 362).

Two new sesquiterpene lactones - inunal and isoalloalantolactone - isolated and characterised (*Phytochemistry* 1985, 24, 2007; *ibid.* 1988, 27, 2079); apilotaxene (heptadeca- 1,8,11,14-tetraene) (22.0%) and phenylacetonitrile (2.0%) determined in essential oil (*Phytochemistry* 1986, 25, 2887); stereochemistry of inunolide and dihydroinunolide revised (*Planta Med.* 1988, 54, 186); isolation of four oxygenated alantolides - I, II, III and isoinunal - from roots together with alantolactone, isoalantolactone and telekin (*Phytochemistry* 1988, 27, 2079).

NEW COMPOUNDS

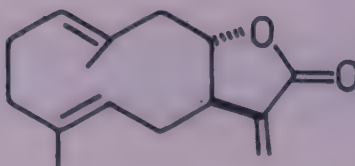


Inunal

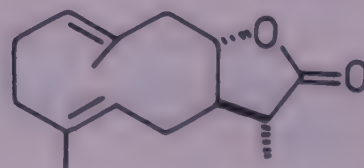
R = CHO

Isoalantolactone

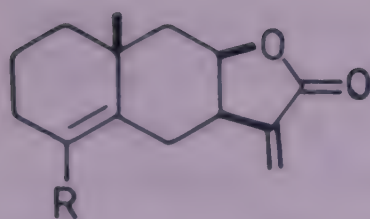
R = Me



Inunolide



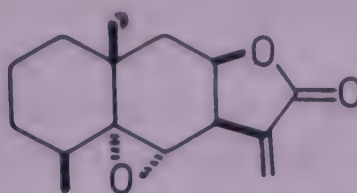
Dihydroinunolide



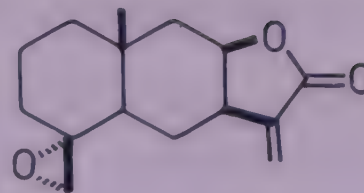
Isoinunal

R = CHO

I

R = CH₂OH

II



III

BIOLOGICAL ACTIVITY

Inunal exhibited plant growth regulatory activity, promoting formation of adventitious roots (*Phytochemistry* 1985, 24, 2007); isoinunal showed potent root initiating activity in hypocotyle cuttings of *Phaseolus aureus* (*Phytochemistry* 1988, 27, 2079).

I. royleana DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 362).

Synthesis of royleanone (*J. Org. Chem.* 1989, 54, 5712).

IPHIGENIA (Liliaceae)

I. stellata Blatter emend. Ansari & Rao

Isolation of colchicoside, colchicine, β -lumicolchicine, 3-demethylcolchicine, 3-demethyl-N-deacetylcolchicine, N-formyl-N-deacetylcolchicine, (S)-bechuanine, multifloramine and kreysiginine from seeds (*Planta Med.* 1985, 51, 72); an improved method for the production of colchicine from seeds; demecolcine and 2-demethylcolchicine also isolated (*Indian Drugs* 1986, 24, 129).

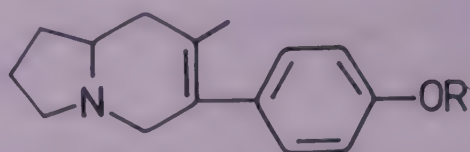
Distribution : Maharashtra.

IPOMOEA (Convolvulaceae)

I. alba L. syn. *Calonyction aculeatum* (L.) House, *Ipomoea bona-nox* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 363).

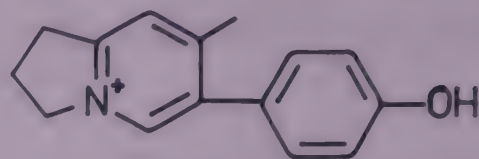
Crystal structure and stereochemistry of (+)ipalbidine (*Youji Huaxue* 1985, 249; *Chem. Abstr.* 1986, 104, 149208 x; *Huaxue Xuebao* 1986, 44, 729; *Chem. Abstr.* 1987, 106, 120114 u); total synthesis of ipalbidine (*Helv. Chim. Acta* 1986, 69, 2048); new indolizine alkaloids - isoipomine, methoxyipomine, dimethoxyipomine and ipalbidinium - isolated from seeds and characterised; ipalbidine, ipalbine and ipomine also isolated (*J. Nat. Prod.* 1987, 50, 152); calonyctin A, isolated from leaves, is a mixture of two glycosides of 11-hydroxyhexadecanoic acid and 11-hydroxytetradecanoic acid, each containing 4 moles of rhamnose (*Xiamen Daxue Xuebao, Ziran Kexueban* 1988, 27, 242; *Chem. Abstr.* 1988, 109, 89804 e).

NEW COMPOUNDS



Isoipomine

R = Glu(6'-p-coumaroyl)



Ipalbidinium

I. batatas (L.) Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 363).

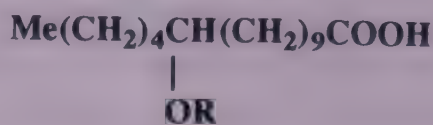
Two major proteins - sporamins A and B - separated by electrophoresis on polyacrylamide from total proteins of tuberous roots and partially characterised (*Phytochemistry* 1985, 24, 1899); 7-hydroxycostal and 7-hydroxycostol synthesised (*J. Agric. Food Chem.* 1985, 33, 717; *Chem. Abstr.* 1985, 103, 37628 g); luteochromene isolated from tubers of Brazilian plant and shown to be mixture of (5R,6S,5'R,8'R) and (5R,6S,5'R,8'S)-5,6,5',8'-diepoxy-5,6,5',8'-tetrahydro- β,β -carotene (*Helv. Chim. Acta* 1986, 69, 1554); isolation of 5,6:5',6'-diepoxy-5,6,5',6'-tetrahydro- β,β -carotene and determination of its absolute configuration as 5R,6S,5' R, 6'S (*Helv. Chim. Acta* 1988, 71, 31).

I. bona-nox L.; see *I. alba* L.

I. dichroa Choisy syn. *I. pilosa* (Roxb.) Sweet (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 391).

Four new fatty acid glycosides - dichrosides A, B, C and D - isolated along with friedelin, stearic acid, β -sitosterol and its glucoside; dichroside D characterised as 11-[O- β -D-glucopyranosyl(1 \rightarrow 4)[O- β -D-fucopyranosyl(1 \rightarrow 3)]-O- α -L-rhamnopyranosyl(1 \rightarrow 4)-O- α -L-rhamnopyranosyl(1 \rightarrow 2)- α -L-rhamnopyranosyloxy]-hexadecanoic acid (*Carbohydr. Res.* 1985, 143, 207; *Chem. Abstr.* 1986, 104, 65842 m; *Fitoterapia* 1986, 57, 29).

NEW COMPOUNDS



Dichroside D

R = Rha(2 \rightarrow 1)Rha(4 \rightarrow 1)Rha[(3 \rightarrow 1)Fuc](4 \rightarrow 1)Glu

I. gomezii Clarke; see *Merremia mammosa* (Lour.) Hallier f.

I. muricata (L.) Jacq.; see *I. turbinata* Lag.

I. pilosa (Roxb.) Sweet; see *I. dichroa* Choisy

I. purpurea (L.) Roth syn. *Pharbitis purpurea* (L.) Voigt (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 364).

Castasterone and brassinone estimated as 1.1 and 0.2 $\mu\text{g/kg}$ respectively in fresh immature seeds (*Agric. Biol. Chem.* 1985, 49, 49); 2-hydroxy-1-phenyl-pentan-1,4-dione and phenylglyoxal isolated; the former found to be artifact formed by condensation of acetone and phenylglyoxal (*Agric. Biol. Chem.* 1988, 52, 1013).

BIOLOGICAL ACTIVITY

2-Hydroxy-1-phenyl-pentane-1,4-dione and phenylglyoxal exhibited flower-inducing property in *Lemna paucicostata* 151; activity was inhibited by GA₃, ABA and IAA but promoted by zeatin (*Agric. Biol. Chem.* 1988, 52, 1013).

I. reniformis (Roxb.) Choisy; see *Merremia gangetica* (L.) Cufo

I. sinuata Ortega; see *Merremia dissecta* (Jacq.) Hallier f.

I. turbinata Lag. syn. *I. muricata* (L.) Jacq., *Calonyction muricatum* (L.) G. Don (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 365).

Isolation of five resin glycosides - Mb-1, Mb-2, Mb-3, Mb-4 and Mb-5 - from seeds and characterisation of Mb-1 (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 427; *Chem. Abstr.* 1986, 104, 145482 j); four new laxative glycosides (I, II, III and IV) isolated from seeds (Jpn. 62,207,287 (1987) Sept. 11; *Chem. Abstr.* 1988, 109, 134964 v); alkaline hydrolysis of glycoside fraction from seeds, containing muricaticins A and B (*Phytochemistry* 1967, 6, 735), gave muricatic acids A, B and C together with isobutyric, 2(S)methylbutyric and 3-hydroxy-2-methylbutyric acids; structure elucidation of muricatic acids A and B (*Chem. Pharm. Bull.* 1988, 36, 627); muricaticins I-VI isolated from seeds and characterised as monomers of a jalapinic acid tetraglycoside (*Chem. Pharm. Bull.* 1988, 36, 920); isolation and structure elucidation of muricatin VII and muricatin VIII from seeds; muricatic acid C identified as glycosidic acid of muricatin VIII (*Chem. Pharm. Bull.* 1988, 36, 1707).

NEW COMPOUNDS



Muricatic acid A

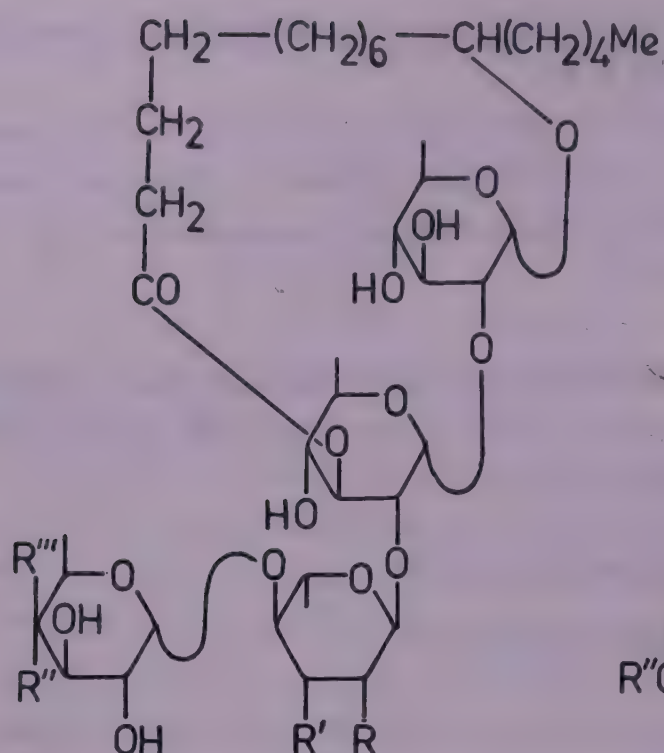
R = Quinovose(2→1)Quinovose(2→1)Rha(4→1)Fuc

Muricatic acid B

R = Quinovose(2→1)Quinovose(2→1)Rha(4→1)Quinovose

Muricatic acid C

R = Quinovose(2→1)Quinovose[(2→1)Rha](3→1)Quinovose

**Muricatin I**

$R, R''' = 2\text{-Me Butyryloxy},$

$R' = \text{OH}, R'' = \text{H}$

Muricatin II

$R = 2\text{-Me Butyryloxy}, R' = \text{OH},$

$R'' = \text{H}, R''' = \text{Isobutyryloxy}$

Muricatin III

$R = \text{OH}, R', R''' = 2\text{-Me Butyryloxy},$
 $R'' = \text{H}$

Muricatin IV

$R = \text{OH}, R' = 2\text{-Me Butyryloxy},$

$R'' = \text{H}, R''' = \text{Isobutyryloxy}$

Muricatin V

$R = 2\text{-Me Butyryloxy}, R', R''' = \text{OH}, R'' = \text{H}$

Muricatin VI

$R = 2\text{-Me Butyryloxy}, R', R'' = \text{OH}, R''' = \text{H}$

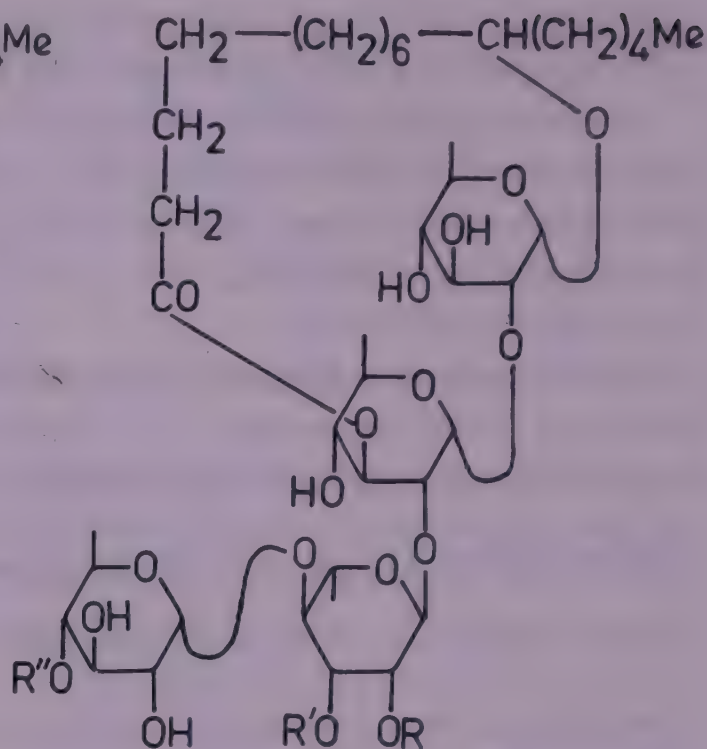
Muricatin VII

$R = 2\text{-Me Butyryloxy}, R' = \text{OH}, R'' = \text{H},$

$R''' = \text{O.COCH(Me)C(OH)Me}$

Mb-I

$R = \text{OH}, R', R''' = 2\text{-Me Butyryloxy}, R'' = \text{H}$

**I**

$R = \text{H}, R' = 2\text{-Me Butyryl}, R'' = \text{Isobutyryl}$

II

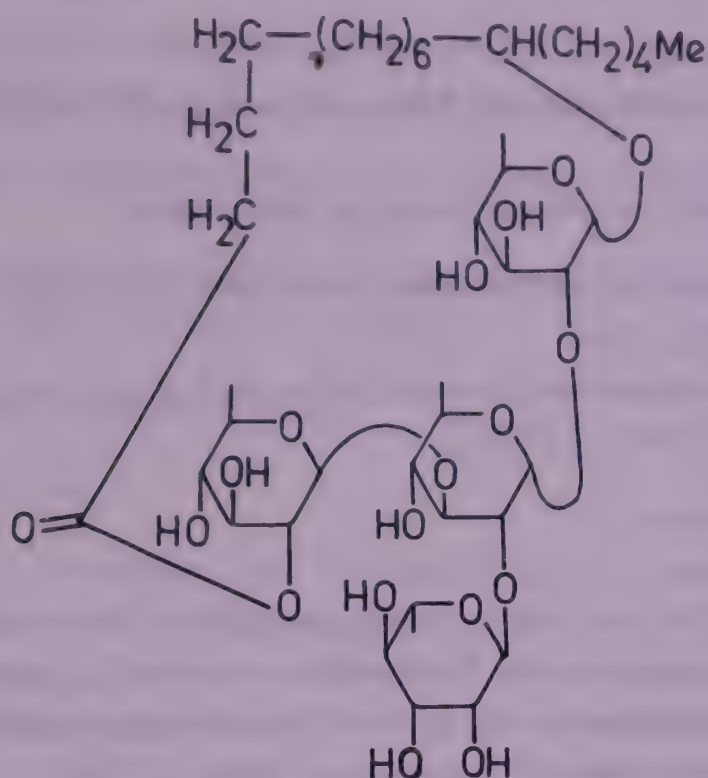
$R, R'' = 2\text{-Me Butyryl}, R' = \text{H}$

III

$R = 2\text{-Me Butyryl}, R' = \text{H}, R'' = \text{Isobutyryl}$

IV

$R = 2\text{-Me Butyryl}, R', R'' = \text{H}$



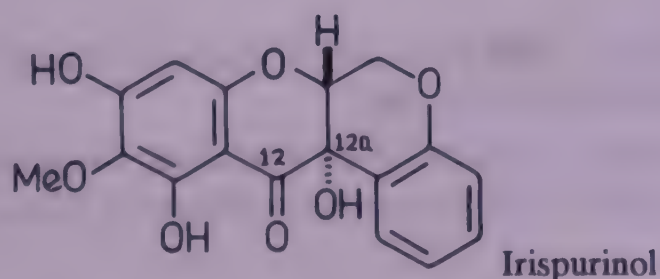
I. turpethum (L.) R.Br.; see *Operculina turpethum* (L.) Silva Manso

IRIS (Iridaceae)

Embinin characterised as 6-C-neohesperidosyl-7,4'-di-O-methylapigenin (*Farmatsiya* 1985, 35, 10; *Chem. Abstr.* 1985, 103, 175413 j).

Isolation of 5,7-dihydroxy-6,2'-dimethoxyisoflavone together with iristectorigenin A and iristectorin A and its structure elucidation (*Phytochemistry* 1984, 23, 2405); two new compounds isolated from rhizomes and characterised as 5,2'-dihydroxy-7,8-dimethoxyisoflavone and 5,8,2'-trihydroxy-7-methoxyflavanone (*Phytochemistry* 1988, 27, 1559); a new 12a-hydroxyrotenoid - irisipurinol - isolated from rhizomes and its structure elucidated (*Phytochemistry* 1988, 27, 3331).

NEW COMPOUNDS



I. hookeriana Foster

Isolation of irisflorentin, irigenin, iridin and junipegenin A from rhizomes (*J. Nat. Prod.* 1985, 48, 849).

Distribution : Kashmir, Ladakh and Lahul, alt. 3000-4500 m.

I. kumaonensis Wall. ex G.Don (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 394).

Isolation of iriskumaonin and its methyl ether, irisflorentin, junipegenin A, irigenin and iridin (*Phytochemistry* 1984, 23, 2703).

I. milesii Baker ex Foster

Eng. - Iris.

Isolation of 5,6,7,4'-tetrahydroxy-8-methoxyisoflavone from rhizomes and its characterisation; prunetin, sakuranetin, 2,6-dimethoxy-1,4-benzoquinone, tectorigenin, tectoridin, irigenin, iridin, iristectorin B, quercetin 3-methyl ether and 4 β -D-glucosyloxyferulic acid methyl ester also isolated (*Phytochemistry* 1984, 23, 1342); 5,6,7,4'-tetrahydroxy-3'-methoxy-isoflavone isolated and its structure determined (*Phytochemistry* 1984, 23, 2703).

Distribution : Kashmir, alt. 1800-2500 m.

I. spuria L.; see *I. florentina* L.

ISATIS (Brassicaceae)

I. tinctoria L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 366).

Isolation of uridine, hypoxanthine, uracil, indigo, β -sitosterol, palmitic acid and salicylic acid from roots (*Zhongyao Tongbao* 1988, 13, 31; *Chem. Abstr.* 1988, 108, 201775 d); indigo precursor, previously named indican, detected in trace amounts in leaves and roots, now identified as isatan B (indoxyl-5-ketogluconate) (*Biochem. Physiol. Pflanz.* 1989, 184, 321; *Chem. Abstr.* 1989, 110, 209329 y).

BIOLOGICAL ACTIVITY

Uridine, hypoxanthin, uracil and salicylic acid inhibited blood platelet aggregation induced by ADP (*Zhongyao Tongbao* 1988, 13, 31; *Chem. Abstr.* 1988, 108, 201775 d).

IXORA (Rubiaceae)

I. arborea Roxb. ex Sm. syn. *I. parviflora* Vahl (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 366).

A new flavone glycoside - chrysin-5-O-xylopyranoside - isolated from stems and characterised (*Phytochemistry* 1984, 23, 2404); aerial parts afforded 6,7-dimethoxy coumarin whereas

ceryl alcohol, β -sitosterol, cysteine, serine, glycine, proline and aspartic acid isolated from seeds (*J. Pharm. (Pakistan)* 1986, 5, 51; *Chem. Abstr.* 1988, 108, 11063 x).

I. coccinea L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 228).

Identification of methyl ester of palmitic, stearic, oleic and linoleic acids in root oil (*Asian J. Chem.* 1989, 1, 307; *Chem. Abstr.* 1989, 111, 229024 u).

I. parviflora Vahl; see *I. arborea* Roxb. ex Sm.

JACARANDA (Bignoniaceae)

J. mimosaeifolia D.Don (*mimosifolia*) syn. *J. ovalifolia* R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 367).

A new glucose ester - jacaranose - isolated from leaves together with jacaranone, verbascoside and phenylacetic- β -glucoside (*Rev. Latinoam. Quim.* 1988, 19, 17; *Chem. Abstr.* 1988, 109, 208248 p).

J. ovalifolia R.Br.; see *J. mimosaeifolia* D.Don

JAMESBRITTENIA (Scrophulariaceae)

J. dissecta (Delile) O. Kuntze; see *Sutera dissecta* (Delile) Walp.

JASMINUM (Oleaceae)

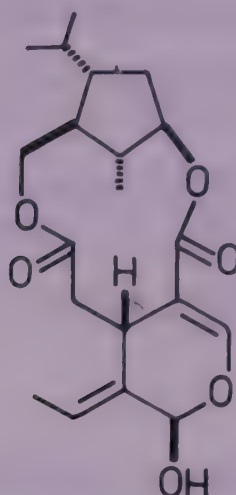
J. auriculatum Vahl (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 367).

Synthesis of jasmone and dihydrojasmone (*Huaxue Xuebao* 1984, 44, 84; *Chem. Abstr.* 1986, 105, 171886 j).

J. azoricum L. syn. *J. flexile* Vahl (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 367).

Isolation of friedelin, lupeol, α -amyrin, betulin and betulinic, ursolic and oleanolic acids from leaves (*Indian Drugs* 1985, 22, 625); a new seco-iridoid - 9'-deoxyjasminigenin - isolated from flowers and its structure elucidated (*Egypt. J. Pharm. Sci.* 1986, 27, 221; *Chem. Abstr.* 1987, 107, 20722 t).

NEW COMPOUNDS



9'-Deoxyjasminigenin

J. flexile Vahl; see *J. azoricum* L.

J. grandiflorum L. syn. *J. officinale* L. var. *grandiflorum* Bailey (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 368).

Synthesis of (-)-methyl jasmonate (*J. Org. Chem.* 1985, 50, 2589).

J. multiflorum (Burm.f.) Andrews syn. *J. pubescens* (Retz.) Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 144).

Friedelin, lupeol, betulin, α -amyrin and betulinic, ursolic and oleanolic acids isolated from leaves (*Indian Drugs* 1985, 22, 625).

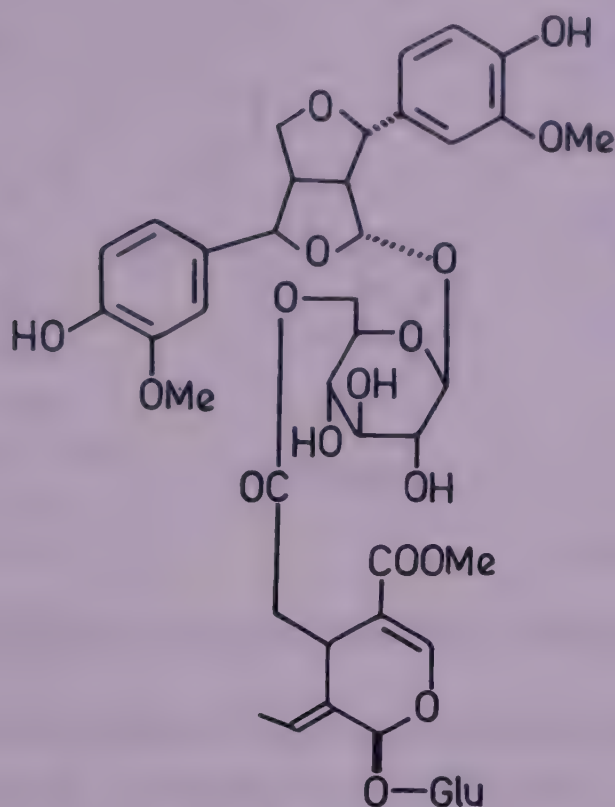
J. officinale L. var. *grandiflorum* Bailey; see *J. grandiflorum* L.

J. pubescens (Retz.) Willd.; see *J. multiflorum* (Burm.f.) Andrews

J. sambac (L.) Ait. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 368).

Friedelin, lupeol, betulin, α -amyrin and betulinic, ursolic and oleanolic acids isolated from leaves (*Indian Drugs* 1985, 22, 625); isolation of 9'-deoxyjasminigenin, jasminin and 8,9-dihydrojasminin from flowers (*Egypt. J. Pharm. Sci.* 1985, 26, 163; *Chem. Abstr.* 1987, 107, 20719 x); linalool, cis-caryophyllene, indole, benzyl acetate, cis-3-hexenyl benzoate and methyl anthranilate identified in flower oil by GC-MS (*Zhiwu Xuebao* 1985, 27, 186; *Chem. Abstr.* 1985, 103, 42388 h); phenylmethanol, linalool, α -terpineol, cis-3-hexen-1-ol, methylphenyl acetate and methyl benzoate also identified in volatile oil of flowers (*Beijing Daxue Xuebao Ziran Kexueban* 1987, 53; *Chem. Abstr.* 1988, 109, 115834 m); a new seco-iridoid glucoside - sambacolignoside - isolated along with oleoside 11- methyl ester and its structure determined (*Chem. Pharm. Bull.* 1987, 35, 5032).

NEW COMPOUNDS



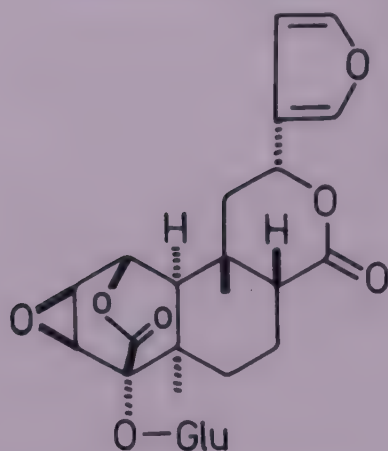
Sambacolignoside

JATEORHIZA (Menispermaceae)

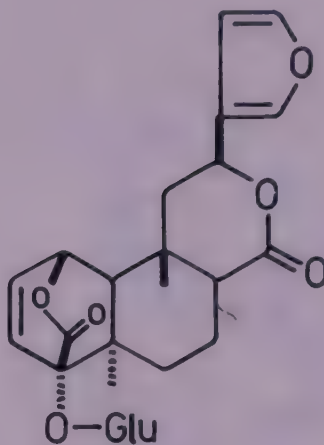
J. palmata (Lamk.) Miers (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 396).

A new furanoid diterpene glucoside - palmatoside A - isolated from roots and characterised as 4-O-(β-D-glucopyranosyl)palmarin (C-8 epimer of palmatoside B); columbin, isocolumbin, chasmanthin, palmarin and isojateorin also isolated (*Ann. Chem.* 1986, 1327); six new diterpenes -palmatosides B, C, D, E, F and G - isolated from roots and their structures elucidated; palmatosides B, C, D, E and F characterised as chasmanthin-4-O-glucoside, columbin-4-O-glucoside, isocolumbin-4-O-glucoside (C-8 epimer of palmatoside C), isojateorin-4-O-glucoside (C-8 and C-12 epimer of palmatoside B) and jateorin-4-O-glucoside (C-12 epimer of palmatoside B) respectively (*Ann. Chem.* 1987, 193); isolation and structure determination of columbinyl glucoside, jateorinyl glucoside and isojateorinyl glucoside by ¹³C-NMR (*Planta Med.* 1987, 53, 271).

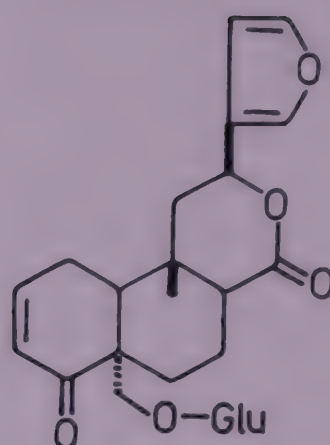
NEW COMPOUNDS



Palmatoside B



Palmatoside C



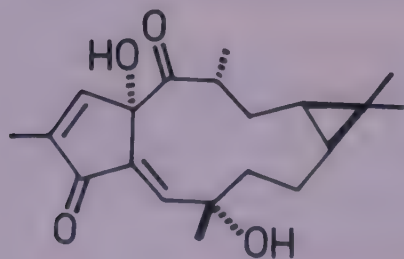
Palmatoside G

JATROPHA (Euphorbiaceae)

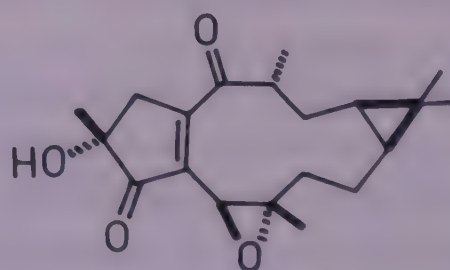
J. curcas L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 397).

Four novel diterpenes - curcusones A, B, C and D - isolated and their structure elucidated (*Tetrahedron Lett.* 1986, 27, 2439); isolation of new lathyranes - curculathyrans A and B - and determination of their structures by NMR and X-ray diffraction (*Tetrahedron Lett.* 1986, 27, 5675); new diterpenoid - jatrophol - isolated from roots together with jatrophin [coumarinolignan (I), *Phytochemistry* 1984, 23, 867], jatrophenones A and B, taraxerol, β -sitosterol and its glucoside; jatrophol characterised as 16-hydroxyjatrophenone (Zhiwu Xuebao 1988, 30, 308; *Chem. Abstr.* 1989, 110, 21068 h); oleic (46.72), linoleic (30.31), palmitic (14.10) and stearic (7.68%) acids present in seed oil (*Pakistan J. Sci. Ind. Res.* 1988, 31, 566; *Chem. Abstr.* 1989, 110, 54512 b).

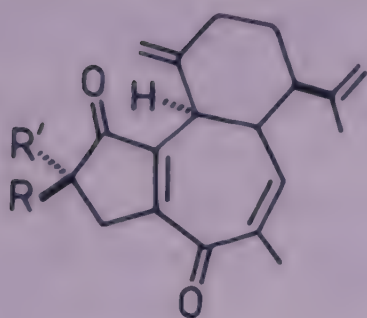
NEW COMPOUNDS



Curculathyrane A



Curculathyrane B



Curcusone A

R = Me, R' = H

Curcusone B

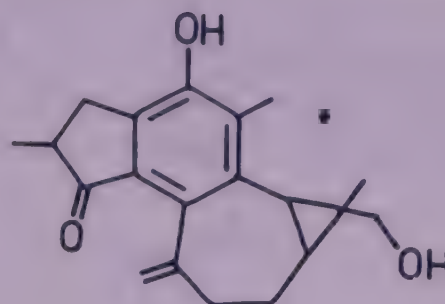
R = H, R' = Me

Curcusone C

R = Me, R' = OH

Curcusone D

R = OH, R' = Me



Jatrophol

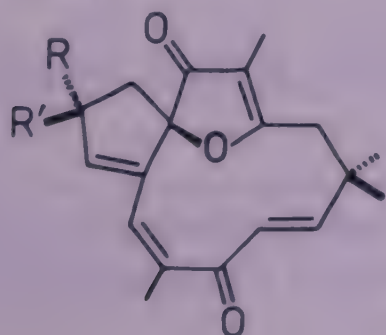
J. glandulifera Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 368).

Structure of jatrophin confirmed by synthesis (*Indian J. Chem.* 1984, 23B, 1005).

J. gossypifolia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 369).

Isolation of a new lignan - gadain - and its stereochemistry (*Phytochemistry* 1984, 23, 2323); palmitone, ceryl alcohol, myricyl alcohol and carnaubyl palmitate from stem bark (*J. Bangladesh Acad. Sci.* 1984, 8, 47; *Chem. Abstr.* 1985, 103, 19868 f); structure of hydroxy-jatrophone C (2 β -hydroxy-5,6-isojatrophone) confirmed by X-ray studies (*J. Crystallogr. Spectrosc. Res.* 1985, 15, 247; *Chem. Abstr.* 1986, 104, 34200 w); a new lignan (I) isolated and characterised as 2,3-bis(hydroxymethyl)-6,7-methylenedioxy-1-(3'-4'-dimethoxyphenyl) naphthalene (*Phytochemistry* 1988, 27, 3684); another new lignan - prasanthaline- isolated and its structure elucidated (*Indian J. Chem.* 1988, 27B, 740); total synthesis of (+)hydroxy-jatrophones A (2 α -hydroxyjatrophone) and (+)hydroxyjatrophone B (2 β -hydroxy-jatrophone) (*J. Am. Chem. Soc.* 1989, 111, 6648).

NEW COMPOUNDS

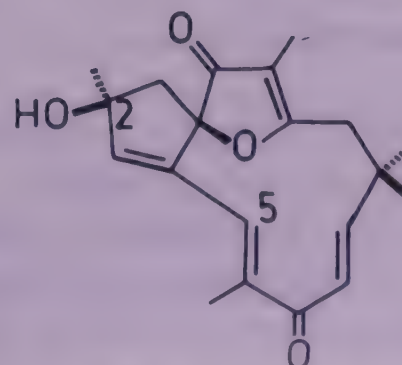


Hydroxyjatrophone A

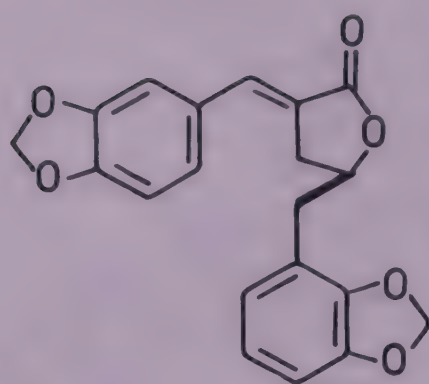
R = OH, R' = H

Hydroxyjatrophone B

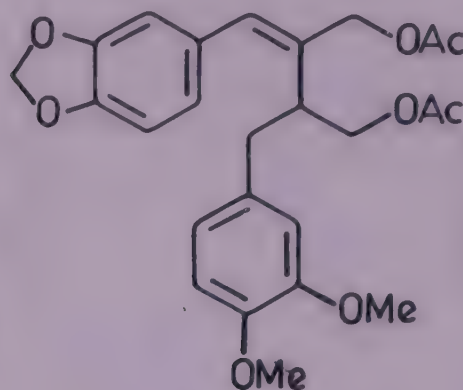
R = H, R' = OH



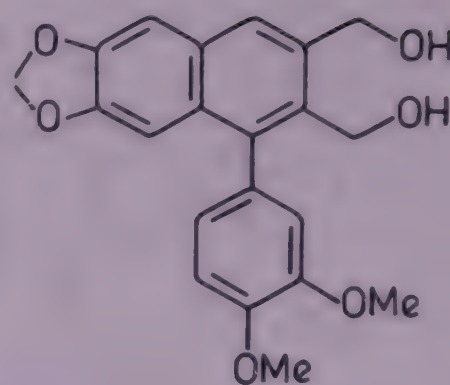
Hydroxyjatrophone C



Gadain



Prasanthaline



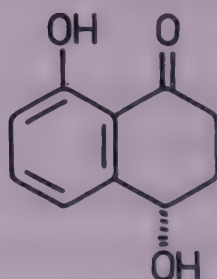
I

JUGLANS (Juglandaceae)

J. regia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 370).

Synthesis of juglone (*Synth. Commun.* 1984, 14, 1167; *Chem. Abstr.* 1985, 102, 95364 h); estradiol and stigmasterol isolated from pollens (*Zhiwu Shengli Xuebao* 1986, 12, 218; *Chem. Abstr.* 1987, 106, 30076 d); a new α -tetralone - (-)regiolone - isolated from stem bark and its stereo-structure determined (*Phytochemistry* 1988, 27, 3929); juglone, betulinic acid and sitosterol also isolated (*Phytochemistry* 1988, 27, 3929; *Indian J. Chem.* 1989, 28B, 356).

NEW COMPOUNDS



(-)Regiolone

BIOLOGICAL ACTIVITY

Juglone inhibited growth of liver ascites carcinoma and S-180 solid tumor in mice; at 0.1 mg/ml, it inhibited DNA formation by liver carcinoma cells *in vitro* (*Shenyang Yaoxueyuan Xuebao* 1987, 4, 166; *Chem. Abstr.* 1988, 108, 87675 u).

JUNIPERUS (Cupressaceae)

J. indica Bertol. syn. *J. pseudosabina* sensu Hook.f. (non Fisch. & Mey.), *J. wallichiana* Hook.f. & Thoms. ex Brandis

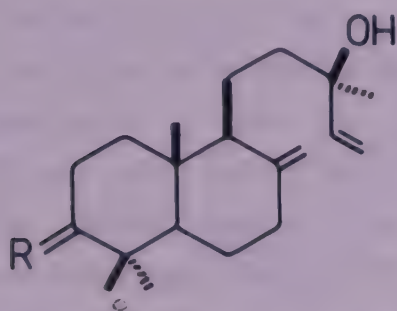
Eng. - Black juniper; H. - Bhil; Sikkim - Tehokpo.

Amentoflavone, cupressuflavone, hinokiflavone and isocryptomerin isolated from leaves (*J. Indian Chem. Soc.* 1985, 62, 410); seven new labdane diterpenes - (+)3-oxomanool, (+)3 α -

hydroxymanool and its isomer (I), 3α -hydroxy- $9\beta,10\beta$ -8(17),12(E)-labdadiene (II), 3α -hydroxy-14,15-dihydro- $8\beta,13\beta$ -manoyloxide (III), 3-oxo-12,13(Z)-biformene and 3α -hydroxy-12,13(Z)-biformene - isolated from aerial parts and their stereostructures determined; (+)manool, 3-oxo-12,13(E)-biformene and 3α -hydroxy-12,13(E)-biformene also isolated (*Indian J. Chem.* 1987, 26B, 453).

Distribution : Himalayas, from Kashmir to Bhutan, alt. 2700-4500 m.

NEW COMPOUNDS

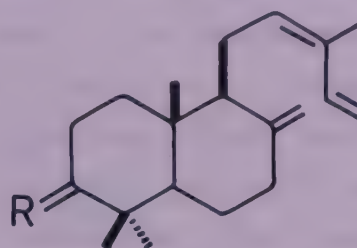


(+) 3α -Hydroxymanool

R = α -OH,H

(+) 3-Oxomanool

R = O

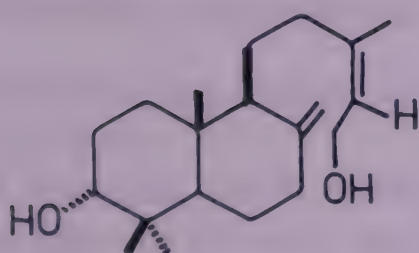


3-Oxo-12,13(Z)-biformene

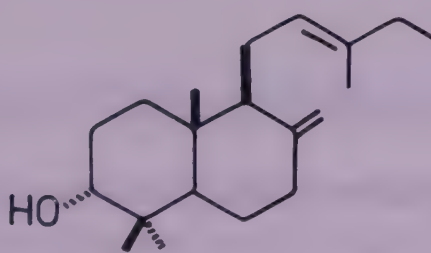
R = O

3α -Hydroxy-12,13(Z)-biformene

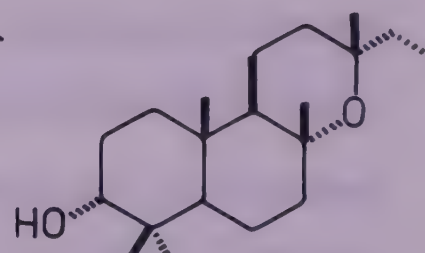
R = α -OH,H



I



II



III

BIOLOGICAL ACTIVITY

Interferon detected in serum of mouse 18 hr after administration of a single dose (1.0 g/kg) of amentoflavone (*Acta Microbiol. Pol.* 1987, 36, 151; *Chem. Abstr.* 1987, 107, 126702 b); amentoflavone (50.0 mg/kg, i.p.) exhibited biphasic anti-ulcerogenic effect in rats against gastric ulcers induced by pylorus ligation or immobilisation stress and duodenal ulcer in guinea pigs induced by histamine. It also inhibited carrageenin-induced inflammation in rats at 25.0 mg/kg, i.p., when administered 45 min before carrageenin challenge (*Indian J. Med. Res.* 1987, 85, 689); mechanisms of anti-inflammatory and anti-ulcerogenic activities of amentoflavone studied. Amentoflavone (50.0 mg/kg) *per se* when administered as a single dose or once daily for four consecutive days increased carbohydrate:protein ratio; it also reversed decrease in this ratio induced by aspirin, indicating that antiulcerogenic effect of amentoflavone may be due to strengthening of gastric mucosal barrier (*Indian J. Med. Res.* 1988, 88, 192).

J. pseudosabina Fisch. & Mey.; see *J. indica* Bertol.

J. recurva Buch.-Ham. ex D.Don var. *squamata* (Buch.-Ham. ex D.Don) Parl.; see *J. squamata* Buch.-Ham. ex D.Don

J. squamata Buch.-Ham. ex D.Don syn. *J. recurva* Buch.-Ham. ex D.Don var. *squamata* (Buch.-Ham. ex D.Don) Parl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 371).

Five new sesquiterpenes - epicedranediol, 4-ketocedrol, 3 β -hydroxycedrol, isocedrolic acid and β -chamigrenic acid - isolated from heartwood and characterised; 8,14-cedranoxide, 8,14-cedranolide, 8,14-cedranediol, cedrol, cedrolic acid, widdrol, 7-oxototarol, hinokiol, sugiol, procerin, hinokiic acid and β -sitosterol also isolated (*J. Chin. Chem. Soc.* 1987, 34, 125; *Chem. Abstr.* 1988, 108, 52837 w); monoterpene hydrocarbons (68.0%), sesquiterpene hydrocarbons (12.0%), oxygenated sesquiterpenes (9.0%) and oxygenated monoterpenes (5.0%) determined in essential oil of leaves and twigs by GC-MS; 4 β -hydroxygermacra-1(10),5-diene, β -oplophenone, oplopanone, 8-acetoxyelemol and manool identified as trace components (*Planta Med.* 1988, 54, 259).

J. wallichiana Hook.f. & Thoms. ex Brandis; see *J. indica* Bertol.

JUSSIAEA (Onagraceae)

J. linifolia Vahl; see *Fissendocarpa linifolia* (Vahl) Bennet .

J. suffruticosa L.; see *Ludwigia octovalvis* (Jacq.) Raven

JUSTICIA (Acanthaceae)

J. procumbens L. var. *procumbens* (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 146).

Methanolic extract of plant showed significant inhibitory activity *in vivo* against P-388 lymphocytic leukemia in mice as well as *in vitro* cytotoxicity in 9-KB (human nasopharyngeal carcinoma) cell culture (*J. Nat. Prod.* 1986, 49, 348).

Justicidins A and E, diphyllin and neojusticins A and B isolated from whole plant (*J. Nat. Prod.* 1986, 49, 348).

BIOLOGICAL ACTIVITY

Justicidin A and diphyllin were active in 9-KB cell culture assay (*J. Nat. Prod.* 1986, 49, 348).

KADSURA (Schisandraceae)

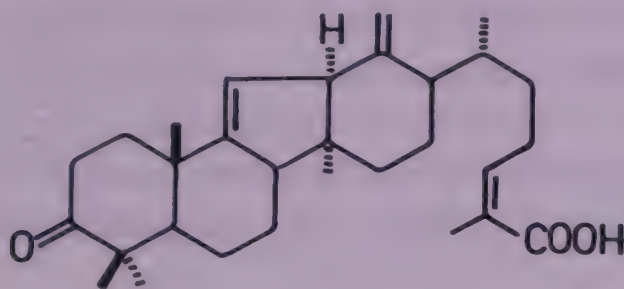
K. heteroclita (Roxb.) Craib. syn. *K. roxburghiana* Arn., *K. wightiana* Arn.

Assam - Kangmari, Mi-ja-ngew, Theiarbawm; Sikkim - Pattiamo, Saladorik.

A 14(13→12)abeo-lanostane derivative - neokadsuranic acid A - and a new triterpenoid - 24(Z)3-oxolano-8,24-dien-26-oic acid - isolated and their structures elucidated (*Planta Med.* 1989, 55, 297).

Distribution: Sikkim, Assam, Meghalaya, Western Ghats, ascending to 2400 m, and in Andaman Islands.

NEW COMPOUNDS



Neokadsuranic acid A

K. roxburghiana Arn.; see *K. heteroclita* (Roxb.) Craib.

K. wightiana Arn.; see *K. heteroclita* (Roxb.) Craib.

KAEMPFERIA (Zingiberaceae)

K. angustifolia Rosc. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 146).

(-)-Pipoxide, (-)(1R,2S,3R,4S)2-benzoyloxymethylcyclohex-5-en-1,2,3,4-tetrol-1,4-dibenzoate and (1R,2S,3R,4S)2-hydroxymethylcyclohex-5-en-1,2,3,4-tetrol-1,4-dibenzoate isolated from rhizomes together with 2'-hydroxy-4,4',6'-trimethoxychalcone, crotepoxide, boesenboxide and (+)zeylenol (*Phytochemistry* 1989, 28, 1143).

K. galanga L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 373).

Isolation of deoxypodophyllotoxin and ethyl p-methoxy-trans-cinnamate from rhizomes (*Chem. Pharm. Bull.* 1985, 35, 5565); new monoterpene ketone - car-3-en-5-one - isolated from rhizomes and characterised (*Phytochemistry* 1987, 26, 3351).

BIOLOGICAL ACTIVITY

Deoxypodophyllotoxin showed cytotoxic activity by inhibiting HeLa cells (*Chem. Pharm. Bull.* 1985, 35, 5565).

K. pandurata Roxb.; see *Boesenbergia rotunda* (L.) Mansf.

KALANCHOE (Crassulaceae)

K. floribunda Wt. & Arn.; see *K. lanceolata* (Forsk.) Pers. var. *lanceolata*

K. integra (Medik.) Kuntze syn. *K. spathulata* (Poir.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 373).

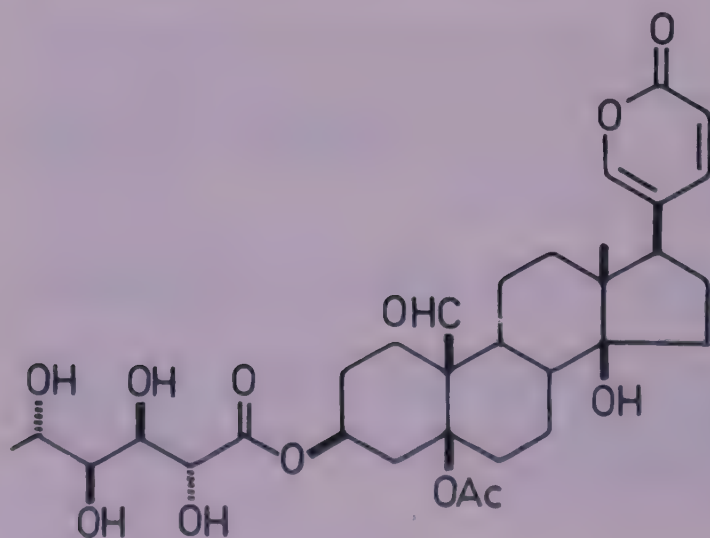
Leaf extract decreased spontaneous motor activity; a dose of 20.0 mg/kg increased pentobarbitone sleeping time (83.0%); conditioned avoidance response in rats was impaired at 100.0 mg/kg. A dose of 25.0 mg/kg produced marked hypotensive effect in anaesthetised dogs, which was not blocked by either atropine or promethazine, and negative inotropic effect on intact dog heart which was responsible for the hypotensive action. It caused dose-dependent inhibition of contractions induced by acetylcholine, histamine and barium on guinea pig ileum but was devoid of any effect on frog rectus abdominis muscle (*Indian J. Pharmacol.* 1986, 18, 78).

Ferulic, syringic, p-coumaric and caffeic acids, patuletin and quercetin isolated from flowers (*Fitoterapia* 1988, 59, 76).

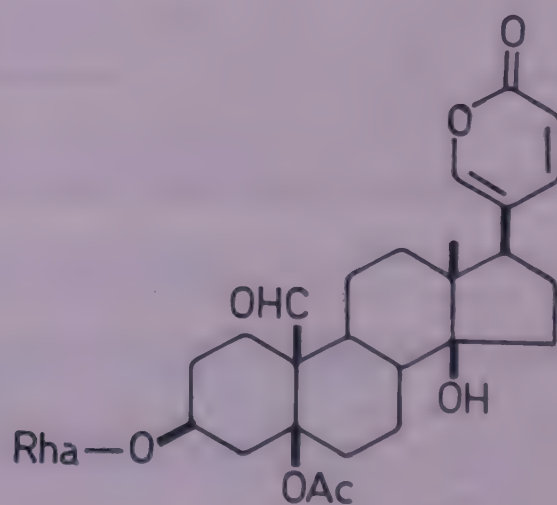
K. lanceolata (Forsk.) Pers. var. *lanceolata* syn. *K. floribunda* Wt. & Arn.

Two novel bufadienolides - lanceotoxins A and B - isolated and characterised (*J. Chem. Soc. Perkin 1* 1984, 1573).

Distribution : Hills of peninsular India, alt. 600-2100 m.

NEW COMPOUNDS

Lanceotoxin A



Lanceotoxin B

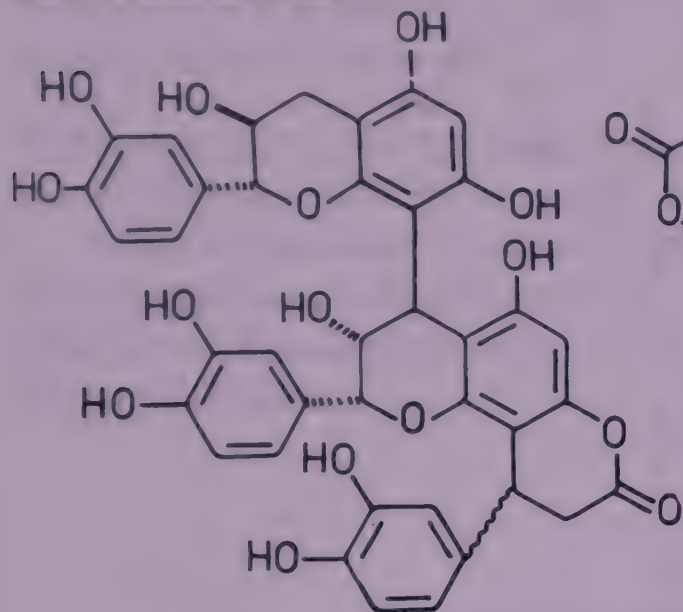
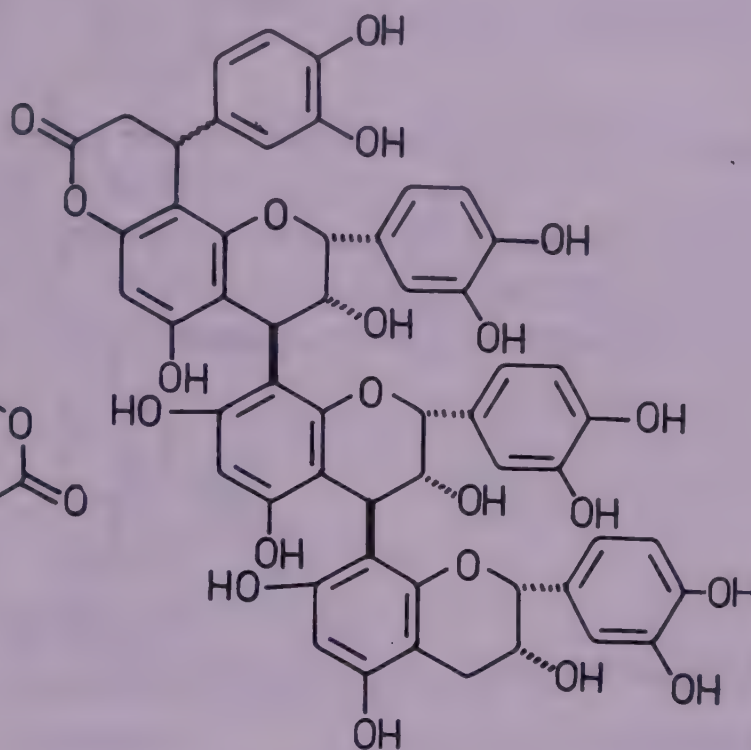
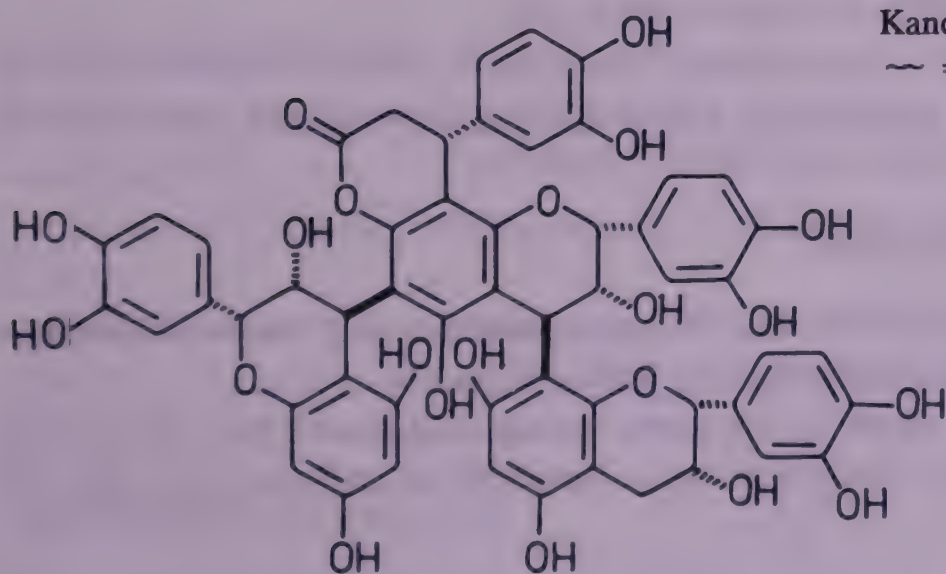
K. pinnata Pers.; see *Bryophyllum pinnatum* (Lam.) Oken

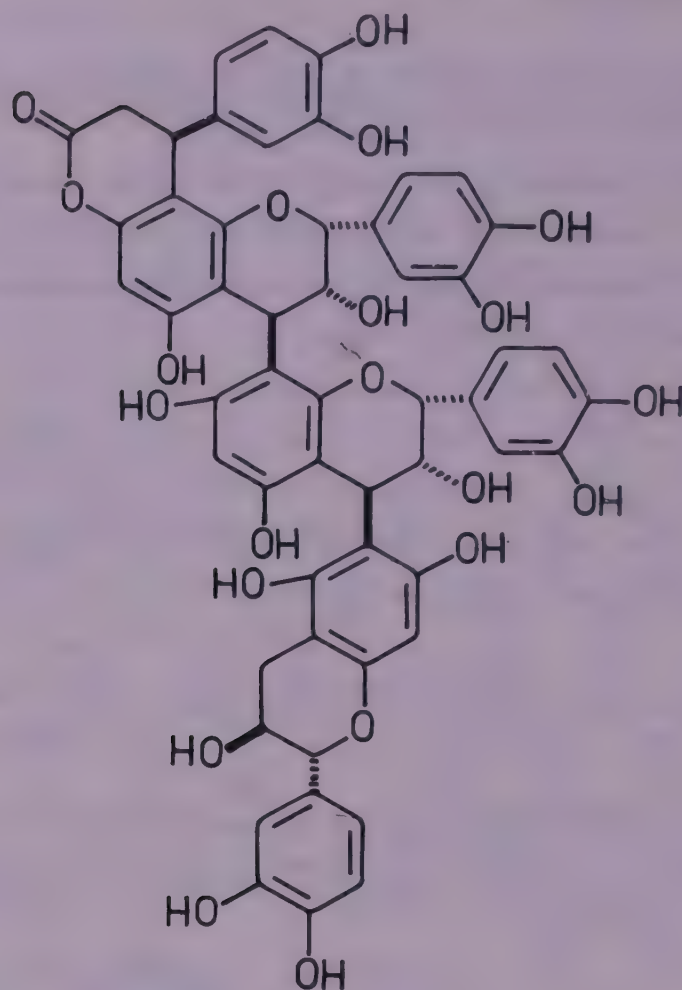
K. spathulata (Poir.) DC.; see *K. integra* (Medik.) Kuntze

KANDELIA (Rhizophoraceae)

K. candel (L.) Druce syn. *K. rheedii* Wt. & Arn. (*rheedei*) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 147).

Two novel proanthocyanidin dimers - kandelins A-1 and A-2 - and four trimers - kandelins B-1, B-2, B-3 and B-4 - isolated from bark together with (+)afzelechin, (+)catechin, (-)epicatechin, (+)gallocatechin, proanthocyanidins B-1, B-2, C-1 and cinchonaines Ia, Ib, IIa and IIb (*Chem. Pharm. Bull.* 1985, 33, 3142).

NEW COMPOUNDS**Kandelin A-1**~ = α **Kandelin A-2**~ = β **Kandelin B-1**~ = α **Kandelin B-2**~ = β **Kandelin B-3**



Kandelin B-4

K. rheedii Wt. & Arn.; see *K. candel* (L.) Druce

KICKXIA (Scrophulariaceae)

K. ramosissima (Wall.) Janchen syn. *Linaria ramosissima* Wall. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 147).

A new flavone glycoside - pectolinarigenin-7-rhamnoside - isolated from leaves and stems along with triacontane, n-pentacosane, n-octacosanol, β -sitosterol and pectolinarigenin (*Pharmazie* 1987, 42, 490; *Chem. Abstr.* 1987, 117, 214843 d).

KINGIODENDRON (Papilionaceae)

K. pinnatum (Roxb. ex DC.) Harms. syn. *Hardwickia pinnata* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 375).

Seeds yielded 16.6% oil which contained vernolic acid (cis-12,13-epoxy-cis-9,10-octadecenoic acid) (7.1%) (*J. Oil Technol. Assoc. India* 1986, 18, 10; *Chem. Abstr.* 1987, 106, 81569 z).

KLEINHOVIA (Sterculiaceae)

K. hospita L. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 375).

Isolation of 3-O-rutinosides of quercetin and kaempferol from leaves and apigenin-8-C-glucoside from flowers (Arogya 1984, 10, 76).

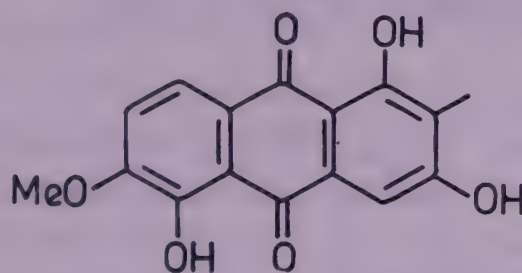
KNOXIA (Rubiaceae)

K. brachycarpa R.Br.; see *K. roxburghii* (Spreng.) M.A.Rau ssp. *brunonis* (Hook.f.) Bhattacharjee & Deb var. *brunonis*

K. roxburghii (Spreng.) M.A.Rau ssp. *brunonis* (Hook.f.) Bhattacharjee & Deb var. *brunonis* syn. *K. brachycarpa* R.Br., *K. valerianoides* Thorel ex Pitard (*veleranoides*)

A new anthraquinone - knoxiadin - isolated from roots along with 3-hydroxymorindone, damnacanthol and rubiadin (Yaoyue Xuebao 1985, 20, 615; Chem. Abstr. 1985, 103, 175424 p).

Distribution : Kumaon in Uttar Pradesh and Parasnath Hills in Bihar, alt. 1000-1200 m.

NEW COMPOUNDS

Knox iadin

K. valerianoides Thorel ex Pitard; see *K. roxburghii* (Spreng.) M.A. Rau ssp. *brunonis* (Hook.f.) Bhattacharjee & Deb var. *brunonis*

KOCHIA (Chenopodiaceae)

K. scoparia (L.) Schrad. (Compend. Indian Med. Plants, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 402).

Antibacterial activity of aliphatic hydrocarbons and sterols evaluated (Fitoterapia 1988, 59, 145).

Wax from aerial parts contained n-alkanes (C24-C35), esters (C38-C58), free alcohols (C18-C32) and a mixture of sterols consisting of campesterol (2.03), stigmasterol (26.18) and sitosterol (70.91%) (Fitoterapia 1988, 59, 145).

KOELREUTERIA (Sapindaceae)

K. apiculata Rehder & Wilson; see *K. paniculata* Laxam.

K. paniculata Laxam. syn. *K. apiculata* Rehder & Wilson

A cyanolipid isolated from seed oil and characterised as diester of 1-cyano-2-hydroxy-methylprop-1-en-3-ol (*Chem. Ind.* 1985, 734).

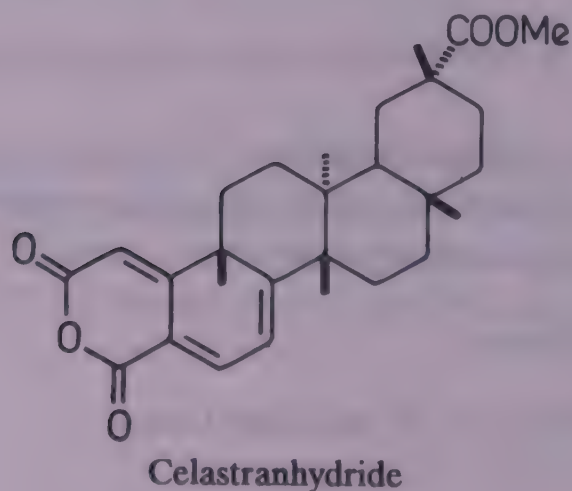
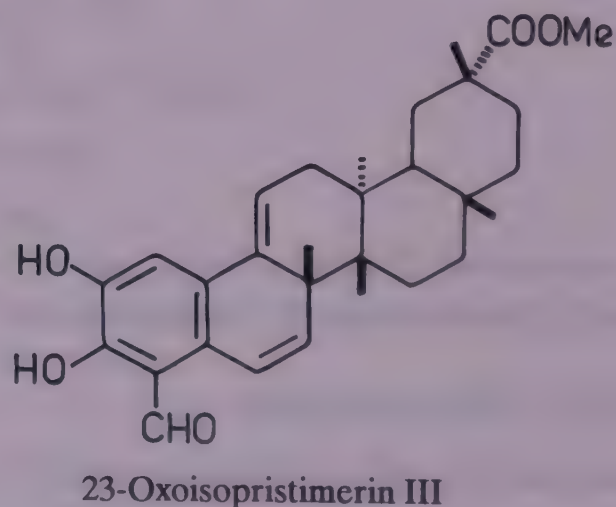
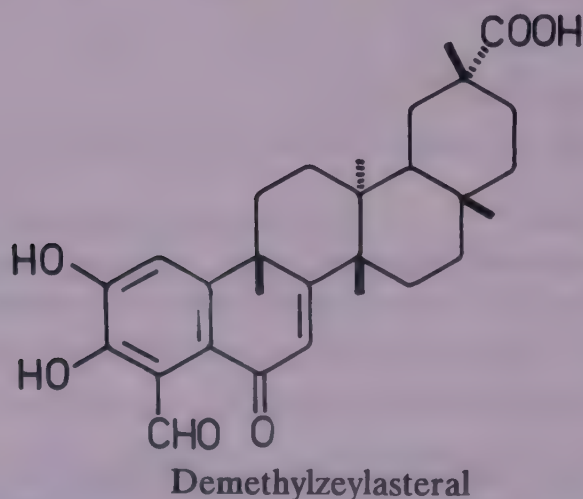
Distribution : Introduced into India and planted in gardens.

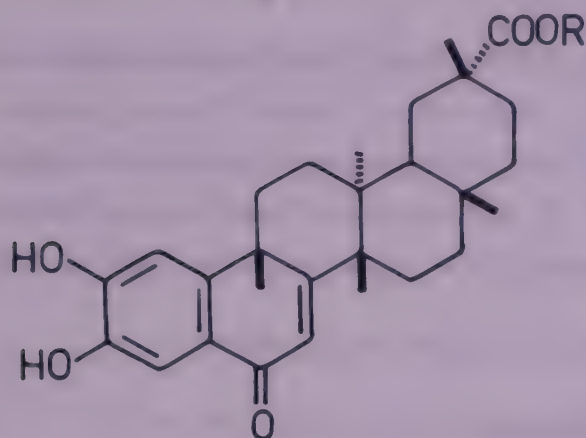
KOKOONA (Celastraceae)

K. zeylanica Thw. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 375).

A new phenolic nortriterpene - demethylzeylasteral - and a new friedo-noroleanane triterpene - 23-oxoisopristimerin III - isolated from stem bark along with zeylasterone, zeylasteral and demethylzeylasterone and new compound characterised (*Stud. Org. Chem.* 1986, 26, 109; *Chem. Abstr.* 1987, 106, 135224 d; *J. Chem. Soc. Perkin 1* 1987, 2849); a new D:A-friedo-23,24-dinoroleanane triterpene - 23-nor-6-oxodemethylpristimerol - isolated and its structure determined (*Stud. Org. Chem.* 1986, 26, 109; *Chem. Abstr.* 1987, 106, 135224 d; *Phytochemistry* 1988, 27, 3221); isolation and characterisation of 23-nor-6-oxopristimerol (*Phytochemistry* 1988, 27, 3221); isolation of new triterpene anhydride - celastranhydride - and its structure elucidation (*Tetrahedron Lett.* 1988, 29, 109).

NEW COMPOUNDS





23-Nor-6-oxopristimerol

R = Me

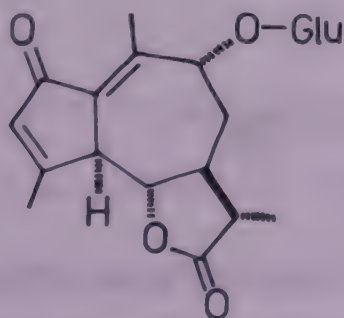
23-Nor-6-oxodemethylpristimerol

R = H

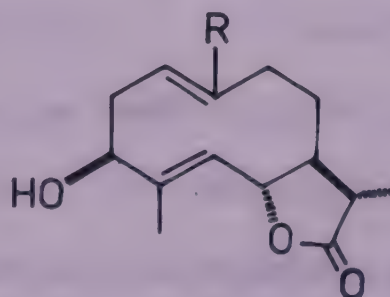
LACTUCA (Asteraceae)

L. sativa L. syn. *L. scariola* L. var. *sativa* (L.) Clarke (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 378).

Two new sesquiterpene lactones - 3β -hydroxy- 11β , 13 -dihydroacanthospermolide and 3β , 14 -dihydroxy- 11β , 13 -dihydrocostunolide - isolated from aerial parts and characterised; hydrolactucin, lactucin and lactupicrin also isolated (*Phytochemistry* 1986, 25, 747); an unidentified compound isolated from stem and named as DLS component (*Int. J. Crude Drug Res.* 1986, 24, 154); isolation of new guaiane type sesquiterpene glycoside - lactuside C - along with lactuside A and macroclinside A; structure determination of lactuside C (*Chem. Pharm. Bull.* 1987, 35, 3905).

NEW COMPOUNDS

Lactuside C

 3β -Hydroxy- 11β , 13 -dihydroacanthospermolide

R = CHO

 3β , 14 -Dihydroxy- 11β , 13 -dihydrocostunolideR = CH₂OH

BIOLOGICAL ACTIVITY

DLS component showed depressant and sedative effects on motor activity and behaviour of toad, *Bufo marinus*; at high doses it caused flaccid paralysis. It depressed striated and smooth muscle contraction in nerve-muscle preparations and this effect was antagonised by administration of Ca^{2+} . It also decreased heart rate and ventricular contraction in normal heart or during tachycardia (*Int. J. Crude Drug Res.* 1986, 24, 154).

L. scariola L. var. *sativa* (L.) Clarke; see *L. sativa* L.

LAGENARIA (Cucurbitaceae)

L. siceraria (Molina) Standl. syn. *L. vulgaris* Ser., *Cucurbita lagenaria* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 378).

Avenasterol, codisterol, clerosterol, isofucosterol, stigmasterol, campesterol, sitosterol, spinasterol, 25(27)-dehydroporiferasterol, 25(27)-dehydrofungisterol, 25(27)-dehydrochondrillasterol, 24 β -ethyl-25(27)-dehydrolathosterol, 24 ξ -methyllathosterol and 22-dihydrospinasterol identified in seeds (*Phytochemistry* 1986, 25, 2591).

L. vulgaris Ser.; see *L. siceraria* (Molina) Standl.

LAGERSTROEMIA (Lythraceae)

L. indica L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 403).

24-Ethylcholest-5-en-3 β -ol (89.9), 24-methylcholest-5-en-3 β -ol (6.5), 24-ethylcholesta-5, 22-dien-3 β -ol (2.3), 24-ethylcholest-7-en-3 β -ol (1.5%), 24-ethylcholesta-5,24(28)-dien-3 β -ol, 24-ethylcholesta-7,24(28)-dien-3 β -ol and cholesterol present in leaves (*Bangladesh J. Sci. Ind. Res.* 1987, 22, 148; *Chem. Abstr.* 1989, 110, 72518 p).

LAGGERA (Asteraceae)

L. alata (D.Don) Sch.-Bip. ex Oliver; see *Blumea alata* (D.Don) DC.

LALLEMANTIA (Lamiaceae)

L. royleana (Wall. ex Benth.) Benth. syn. *Dracocephalum royleanum* Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 149).

Hydrolysis of seed gum afforded galactose, glucose, arabinose and rhamnose in molar ratio of 2.0:1.0:1.6:1.3; purified gum contains pentosans (31.5), uronic anhydride (16.8), protein (1.3) and ash (0.6%) (*Indian Drugs* 1985, 23, 117).

LAMIUM (Lamiaceae)

L. amplexicaule L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 379).

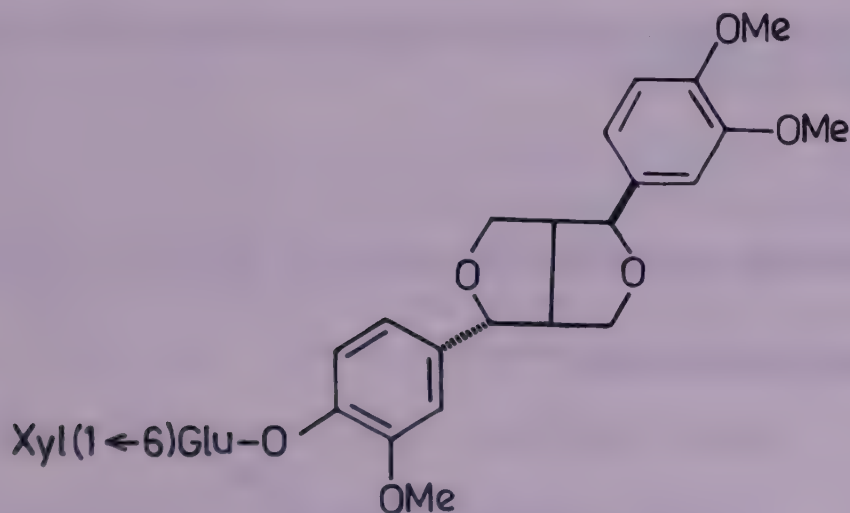
Iridoid glucosides - lamioside, lamalbid, shanzhiside methyl ester and barlerin - isolated (*Chem. Pharm. Bull.* 1986, 34, 876).

LANCEA (Scrophulariaceae)

L. tibetica Hook. f. & Thoms.

A new lignan - lantibeside - isolated and characterised as 4''-O- β -D-xylosyl(1 \rightarrow 6)- β -D-glucosyl)phillygenol; phillygenol and oleanolic acid also isolated (*Zhiwu Xuebao* 1985, 27, 402; *Chem. Abstr.* 1985, 103, 211107 y); isolation of glucose, fructose, sucrose, β -sitosterol, sesamin and ursolic acid from plant (*Lanzhou Daxue Xuebao, Ziran Kexueban* 1987, 23, 156; *Chem. Abstr.* 1988, 109, 51720 m).

Distribution : Himalayas, from Kashmir to Sikkim, alt. 3300-4800 m.

NEW COMPOUNDS

Lantibeside

LANSIUM (Meliaceae)

L. anamallayanum Bedd.; see *Aglaia anamallayana* (Bedd.) Kosterm.

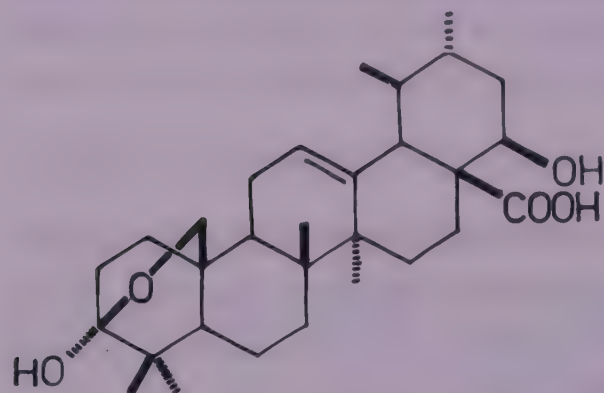
L. domesticum Jack; see *Aglaia domestica* (Correa emend. Jack) Pellegrin

LANTANA (Verbenaceae)

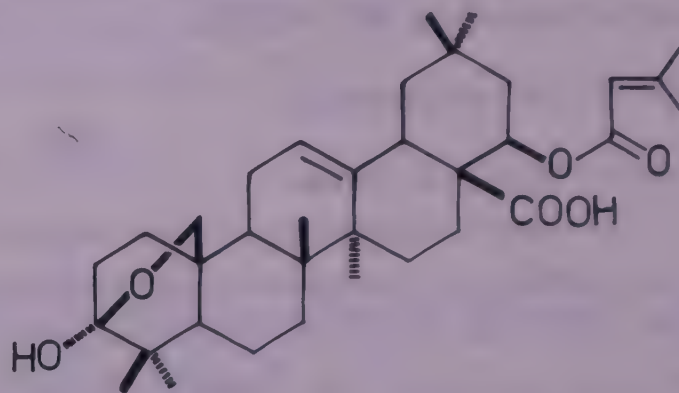
L. camara L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 379).

A new triterpene - lantoic acid - isolated from leaves and its structure determined (*Phytochemistry* 1985, 24, 1607); another triterpene - lantanilic acid - from leaves and its characterisation (*J. Indian Chem. Soc.* 1985, 62, 298).

NEW COMPOUNDS



Lantoic acid



Lantanilic acid

L. indica Roxb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 407).

Leucine, valine, tyrosine and glycine isolated from leaves (*Acta Cienc. Indica, Chem.* 1984, 10, 10; *Chem. Abstr.* 1985, 103, 102043 d).

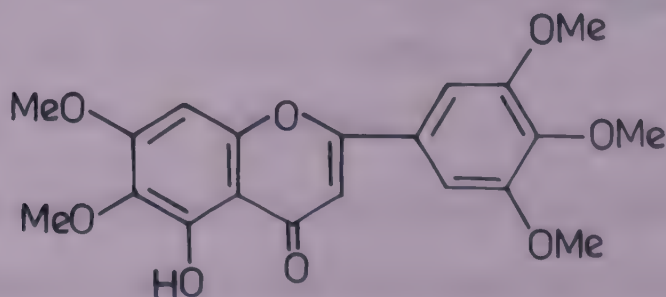
L. trifolia L.

H. - Lantana.

A new flavone - umuhengerin - isolated from leaves and its structure elucidated (*J. Nat. Prod.* 1988, 51, 966).

Distribution : Throughout plains of India.

NEW COMPOUNDS



Umuhengerin

BIOLOGICAL ACTIVITY

Umuhengerin exhibited antibacterial and antifungal activities *in vitro* at concentrations upto 0.2 mg/ml against *Staphylococcus aureus*, *Salmonella typhimurium*, *Candida tropicalis*, *Aspergillus niger*, *Aspergillus fumigatus*, *Trichophyton mentagrophytes* and *Microsporum canis* (*J. Nat. Prod.* 1988, 51, 966).

LAPORTEA (Urticaceae)

L. interrupta (L.) Chew syn. *Fleurya interrupta* (L.) Gaud.

H. - Lal bichu.

Major amino acid in aerial parts identified as proline (0.0019%) (*J. Indian Chem. Soc.* 1988, 65, 227).

Distribution : Assam, Bengal, Bihar, Meghalaya, Orissa, Deccan peninsula from Konkan southwards.

LASTREA (Hypodemataceae)

L. crenata (Forsk.) Bedd.; see *Hypodematium crenatum* (Forsk.) Kuhn

L. eriocarpa Presl; see *Hypodematium crenatum* (Forsk.) Kuhn

L. thelypteris Bedd.; see *Thelypteris palustris* (Salisb.) Schott

LAUNAEA (Asteraceae)

L. aspleniifolia (Willd.) Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 150).

Apigenin, luteolin and their 7-O-glucosides, delphinidin, 7-hydroxy-3',4'-dimethoxy-flavone, lupeol, octacosanoic acid and vitexin identified (*Pharmazie* 1985, 40, 273; *Chem. Abstr.* 1985, 103, 68275 u; *Khim. Pri. Soedin.* 1985, 408; *Chem. Abstr.* 1985, 103, 51218 e); new flavone - asplenetin - isolated and characterised as 5,7,3',4',5'-pentahydroxy-3-(3-methyl-butyl)flavone; asplenetin-5-O-neohesperidoside also isolated (*Phytochemistry* 1985, 24, 873).

L. chondrilloides (DC.) Hook.f.; see *L. resedifolia* (L.) Kuntze

L. mucronata (Forsk.) Muschl.; see *L. resedifolia* (L.) Kuntze

L. nudicaulis Hook.f.; see *L. procumbens* (Roxb.) Rammaya & Rajagopal

L. procumbens (Roxb.) Rammaya & Rajagopal syn. *L. nudicaulis* Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 382).

Aesculetin, cichoriin and luteolin-7-O-glucoside isolated (*Egypt. J. Pharm. Sci.* 1984, 25, 35; *Chem. Abstr.* 1987, 107, 20717 v).

L. resedifolia (L.) Kuntze syn. *L. chondrilloides* (DC.) Hook.f., *L. mucronata* (Forsk.) Muschl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 382).

Apigenin and its 5-O-diglucoside, dihydroxycoumarin and luteolin-7-O-glucoside isolated from Egyptian plant (*Egypt. J. Pharm. Sci.* 1988, 29, 509; *Chem. Abstr.* 1989, 110, 111712 t).

LAURUS (Lauraceae)

L. nobilis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 383).

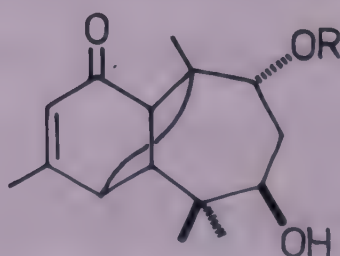
Cis- and trans-thuj-2-en-4-ol identified in oil (*Phytochemistry* 1985, 24, 858); tannins from leaves composed mainly of (+)catechin, (-)epicatechin, (-)epigallocatechin, (+)gallocatechin and procyanidins B2, B4, B5 and B7 (*Z. Lebensm.-Unters. Forsch.* 1985, 180, 494; *Chem. Abstr.* 1985, 103, 85116 k); yield of leaf oil minimum in March (0.13%) and maximum in September (0.36%); cineole (41.9) and eugenol (15.9%) determined by GC as major components in leaf oil (*Pakistan J. Sci. Ind. Res.* 1989, 32, 33; *Chem. Abstr.* 1989, 111, 12321 d).

LAVANDULA (Lamiaceae)

L. officinalis Chaix.; see *L. vera* DC.

L. stoechas L. ssp. *stoechas* (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 409).

Apigenin-7-O- β -D-glucoside, luteolin, its 7-glucoside and 7-glucuronide, rosmarinic acid and 6-caffeoylglucose isolated from leaves (*Bull. Liaison-Groupe Polyphenols* 1986, 13, 624; *Chem. Abstr.* 1988, 108, 19208 u); fenchone (30.85), pinocarveyl acetate (10.20), camphor (9.58), eucalyptol (8.12) and myrtenol (4.65%) determined as major components in essential oil from Greek plant (*Planta Med.* 1988, 54, 58); longipin-2-en-7 β ,9 α -diol-1-one (I) and its 9 α -acetate (II) isolated from aerial parts (*Phytochemistry* 1988, 27, 3966).

NEW COMPOUNDS

I

R = H

II

R = Ac

L. vera DC. syn. *L. officinalis* Chaix. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 384).

Amyl alcohol, amylvinylcarbynyl acetate, ar-curcumene, bergamotene, bornyl acetate, δ -cadinene, camphene, car-3-ene, caryophyllene, cineole, p-cymol, dipentene, farnesene, geraniol, isoamyl alcohol, lavandulol, lavandulyl acetate, linalool, linalyl acetate, linalyl

isobutyrate, β -myrcene, nerol, neryl acetate, α -, β -pinenes, α -santalone, γ -terpinene, terpine-4-ol, terpinyl acetate and α -terpineol identified in essential oil from raceme by GC (*Nauchni Tr.-Plovdivski Univ.* 1984, 22, 207; *Chem. Abstr.* 1986, 105, 21685 d); 3-epiursolic, ursolic and oleanolic acids isolated from inflorescence (*Nauchni Tr.-Plovdivski Univ.* 1984, 22, 213; *Chem. Abstr.* 1986, 105, 21686 e); aromadendrene, cis-carveol, citral- β , dendrolasin, 3,3-dimethylpentane, 5-hexen-2-one, α -humulene, menthane-1,8-diol hydrate, 1-methyl 2-isopropylbenzene, 2-methylpropenal, methylvinyl ketone, myrcenol, 2-octen-4-ol, 7-octen-4-ol, patchoulane, piperitone and pulegone identified by GC-MS in oil (*Sepu* 1985, 2, 75; *Chem. Abstr.* 1985, 103, 119978 k); isolation of 2-N-phenylaminonaphthalene from aerial parts (*Phytochemistry* 1985, 24, 3045).

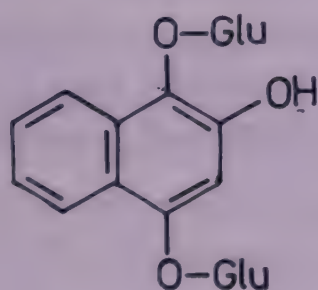
LAWSONIA (Lythraceae)

L. alba Lamk.; see *L. inermis* L.

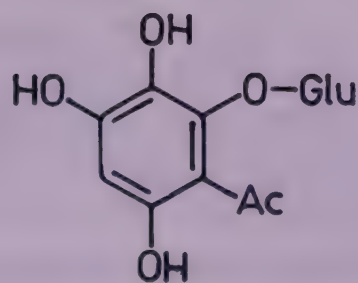
L. inermis L. syn. *L. alba* Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 385).

Lawsone, laxanthone II, luteolin, β -sitosterol and its 3-O-glucoside isolated from leaves (*Indian J. Pharmacol.* 1986, 18, 113); mannitol (0.7%) present in stems; flowers and roots contained lower amounts (*Khim. Prir. Soedin.* 1987, 290; *Chem. Abstr.* 1987, 107, 55743 c); isolation of new phenolic glucosides - lawsoniaside and lalioside - and their characterisation (*J. Nat. Prod.* 1988; 51, 725).

NEW COMPOUNDS



Lawsoniaside



Lalioside

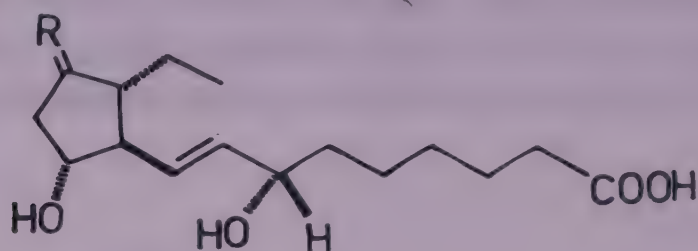
BIOLOGICAL ACTIVITY

Luteolin, lawsone, laxanthone II, β -sitosterol and its 3-O-glucoside exhibited anti-inflammatory activity; β -sitosterol (20.0 mg/kg) was more potent than phenylbutazone (15.0 mg/kg) whereas luteolin and lawsone (20.0 mg/kg) were equipotent to phenylbutazone (15.0 mg/kg) and β -sitosterol-3-O-glucoside (20.0 mg/kg) was equipotent to hydrocortisone acetate (5.0 mg/kg) (*Indian J. Pharmacol.* 1986, 18, 113).

LEMNA (Lemnaceae)

L. minor L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 385).

Two novel cyclopentanoid C16 fatty acids (I & II) isolated and characterised (*J. Nat. Prod.* 1987, 50, 807).

NEW COMPOUNDS**I**

R = O

IIR = α -OH,H**LENS (Papilionaceae)**

L. culinaris Medik. syn. *L. esculenta* Moench, *Ervum lens* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 386).

Isolation of imidazole from seeds as its dansyl derivative (*Phytochemistry* 1987, 26, 3247); kaempferol-3-O- α -L-rhamnosido- β -D-glucosyl-7-O- α -L-rhamnoside, 3-O- α -L-rhamnosido-7-O- β -D-glucoside, 3-O-rutinosyl-7-O- α -L-rhamnoside and 3-O-rutinosyl-7-O- β -D-galactoside isolated from seeds along with p-coumaric and ferulic acids (*Rev. Latinoam. Quim.* 1987, 18, 88; *Chem. Abstr.* 1987, 107, 194879 q); isolation of O-acetyethanolamine (*Phytochemistry* 1987, 26, 839).

L. esculenta Moench; see *L. culinaris* Medik.

LEONOTIS (Lamiaceae)

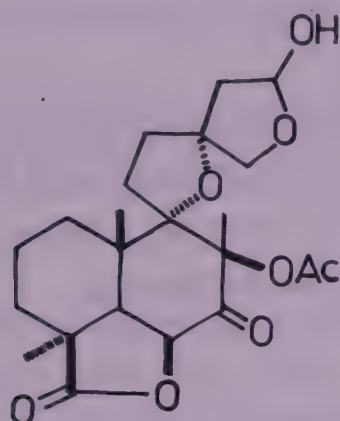
L. nepetaefolia (L.) R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 386).

Campesterol, n-octacosanol, n-octacosanoic acid, quercetin, β -sitosterol- β -D-glucopyranoside and 4,6,7-trimethoxy-5-methylchromene-2-one isolated from roots (*Indian Drugs* 1988, 26, 127).

LEONURUS (Lamiaceae)

L. cardiaca L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 386).

Quercitrin, isoquercitrin, rutin, hyperoside, quercetin-7-O- β -D-glucoside, kaempferol-3-O- β -D-glucoside, apigenin-5-, 7- and 4'-O- β -D-glucosides and quinqueloside isolated (*J. Nat. Prod.* 1985, 48, 494); isolation of a new labdane diterpenoid - leocardin - from aerial parts and its structure elucidation (*Phytochemistry* 1985, 24, 2341).

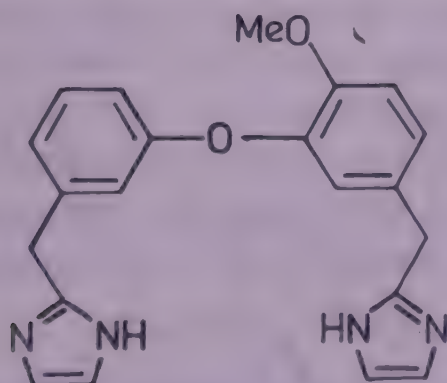
NEW COMPOUNDS

Leocardin

LEPIDIUM (Brassicaceae)

L. sativum L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 412).

A new alkaloid - lepidine - isolated from seeds along with sinapic acid ethyl ester, N,N'-dibenzylthiourea and N,N'-dibenzylurea; new compound characterised (*J. Soc. Chim. Tunis.* 1985, 2, 15; *Chem. Abstr.* 1986, 104, 65910 g); 5,4'-dihydroxy-7,8,3',5'-tetramethoxyflavone and two new isomeric flavanones - 5,3'-dihydroxy-7,8,4'-trimethoxyflavanone and 5,3'-dihydroxy-6,7,4'-trimethoxyflavanone - isolated and their structures determined and confirmed by synthesis (*Indian J. Chem.* 1987, 26B, 82).

NEW COMPOUNDS

Lepidine

LEPTADENIA (Asclepiadaceae)

L. pyrotechnica (Forsk.) Decne. syn. *L. spartium* Wt. & Arn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 387).

Cetyl alcohol, β -sitosterol, n-triacontane, β -amyrin acetate, lupanol-3-O-diglucoside and an uncharacterised compound named leptidin glucoside isolated (*Herba Pol.* 1988, 34, 85; *Chem. Abstr.* 1989, 110, 209317 t).

L. spartium Wt. & Arn.; see *L. pyrotechnica* (Forsk.) Decne.

LESPEDEZA (Papilionaceae)

L. striata (Thunb.) Hook. & Arn.

Eng. - Japanese clover, Annual lespedeza, Common lespedeza.

Cinnamic, ferulic, gallic, gentisic and syringic acids isolated from root exudate (*Trans. Ky. Acad. Sci.* 1985, 46, 51; *Chem. Abstr.* 1985, 103, 19895 n).

Distribution : Meghalaya and Arunachal Pradesh.

LEUCAENA (Mimosaceae)

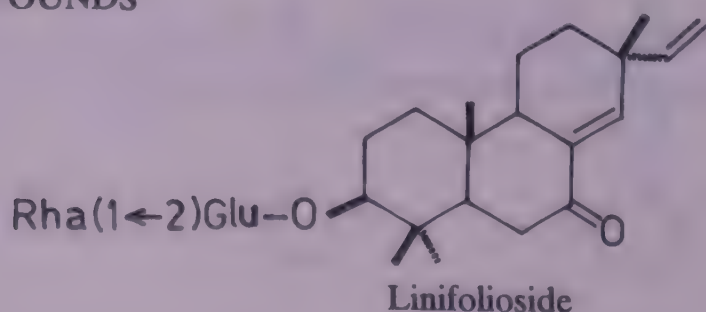
L. leucocephala (Lamk.) de Wit (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 388).

Oleic (42.45), stearic (20.85), palmitic (18.75), lignoceric (3.52), arachidic (1.95), linoleic (0.65), capric (0.16) and lauric (0.16%) acids determined in seed oil (*Pakistan J. Sci. Ind. Res.* 1988, 31, 428; *Chem. Abstr.* 1989, 110, 21081 g).

LEUCAS (Lamiaceae)

L. indica (L.) R.Br. ex Vatke syn. *L. lavandulifolia* Smith (*lavandulaefolia*), *L. linifolia* (Roth) Spreng. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 153).

Isolation of acacetin and chrysoeriol from aerial parts (*Acta Pharm. Indones.* 1985, 10, 27; *Chem. Abstr.* 1986, 104, 48753 r); a new compound - linifolioside - isolated and characterised as isopimar-8(14),15-diene-7-keto-3-O- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-glucopyranoside (*Phytochemistry* 1986, 25, 909).

NEW COMPOUNDS

L. lanata Benth.

Isolation of brassicasterol, campesterol, cholesterol, β -sitosterol and stigmasterol (*J. Indian Chem. Soc.* 1987, 64, 582).

Distribution : Himalayas from Kashmir to Nepal, Darjeeling, Nilgiris, alt. 900-2400 m. Also upper Gangetic Plains, Chhota Nagpur, Assam and peninsular India.

L. lavandulifolia Smith; see *L. indica* (L.) R.Br. ex Vatke

L. linifolia (Roth) Spreng.; see *L. indica* (L.) R.Br. ex Vatke

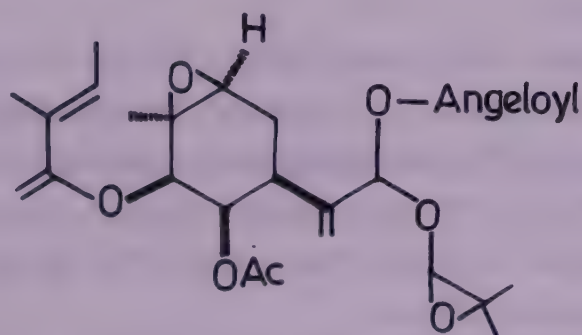
L. urticaefolia (Vahl) R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 388).

Total flavonoid content (0.85%) determined in leaves; kaempferol and quercetin as major flavonoids present (*Indian J. Pharm. Sci.* 1988, 50, 133).

LIGULARIA (Asteraceae)

L. thomsonii (Clarke) Pojark syn. *Senecio thomsonii* Clarke (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 414).

Isolation of a new monoterpenoid - liganolide - from roots and its structure determination by X-ray analysis (*Khim. Prir. Soedin.* 1987, 799; *Chem. Abstr.* 1988, 108, 218971 n).

NEW COMPOUNDS

Liganolide

LIGUSTRUM (Apiaceae)

L. lucidum Ait. syn. *L. nepalense* Wall. ex Roxb. var. *glabrum* Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 390).

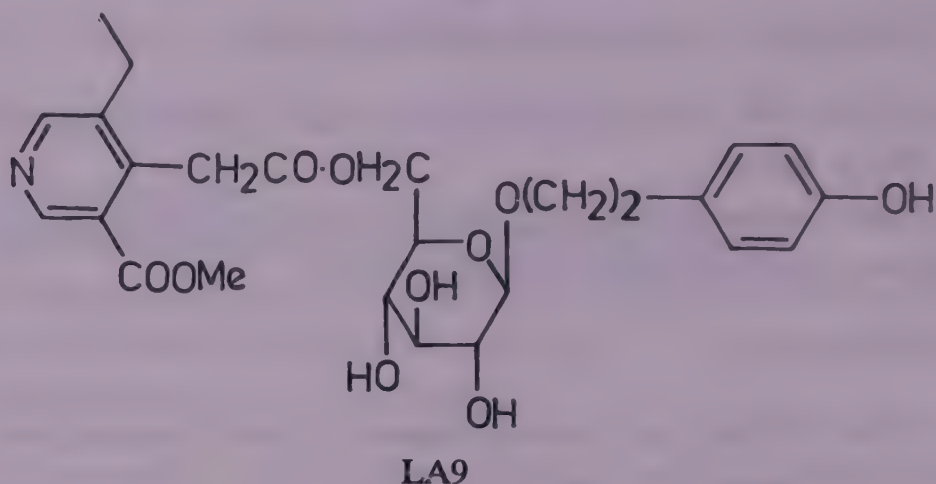
Fruit extract and its active principle, oleanolic acid, protected against chromosomal damage induced by cyclophosphamide or urethane in mice; frequency of micronuclei in bone marrow was also decreased (*Zhongguo Yaoke Daxue Xuebao* 1987, 18, 222; *Chem. Abstr.* 1988, 108, 311 a).

L. nepalense Wall. ex Roxb. var. *glabrum* Hook.f.; see *L. lucidum* Ait.

L. vulgare L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 415).

A novel glucosidic alkaloid artifact - LA9 - isolated from fruits and characterised (*Arch. Pharm.* 1988, 321, 357; *Chem. Abstr.* 1988, 109, 107742 q); ligustroside, oleuropein, β -sitosterol, its glucoside and ursolic acid isolated from fruits and leaves (*Herba Pol.* 1988, 34, 103; *Chem. Abstr.* 1989, 111, 150593 v).

NEW COMPOUNDS



LILIUM (Liliaceae)

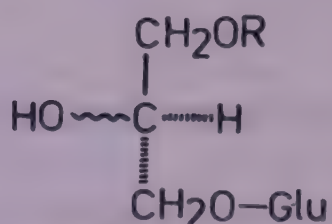
L. auratum Lindl.

Eng. - Golden-rayed lily.

A mixture of 1-O-feruloyl-2-O-p-coumaroylglycerol and 1-O-p-coumaroyl-2-O-feruloylglycerol along with 1-O-feruloylglycerol, 1,2-O- and 1,3-O-diferuloylglycerols, 1-O-feruloyl-3-O-p-coumaroylglycerol and 1-O-p-coumaroylglycerol isolated from fresh bulbs and characterised (*Phytochemistry* 1987, 26, 844); isolation and structure elucidation of epiregaloside A, epiregaloside F and regaloside G (*Chem. Pharm. Bull.* 1988, 36, 4841).

Distribution : Grown in gardens in India.

NEW COMPOUNDS

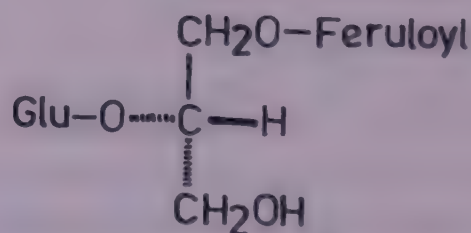


Epiregaloside A

R = p-Coumaroyl, ~ = α

Epiregaloside F

R = Feruloyl, ~ = β

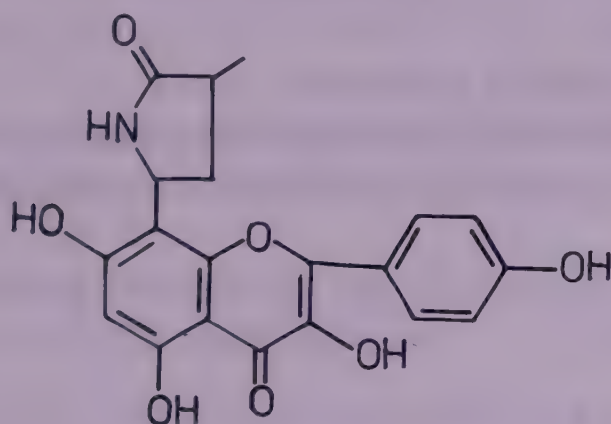


Regaloside G

L. candidum L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 415).

Isolation of a new flavonoid - lilyn - from perianth of flowers and its characterisation as kaempferol-3-O- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-galactopyranoside (*Z. Naturforsch.* 1984, 39B, 1813; *Chem. Abstr.* 1985, 102, 128838 w; *Stud. Org. Chem.* 1988, 23, 265; *Chem. Abstr.* 1986, 105, 149745 r); in addition, kaempferol-3-O- β -D-xylopyranosyl(1 \rightarrow 2)- β -D-glucopyranoside isolated from stamens (*Stud. Org. Chem.* 1986, 23, 265; *Chem. Abstr.* 1986, 105, 149745 r); isolation of new flavonoid alkaloid - lilaline - and its structure elucidation as 3,5,7,4'-tetrahydroxy-8-(3''-methyl-2''-oxo-pyrrolidinyl)flavone (*Phytochemistry* 1987, 26, 1844); 1-(2'-oxo-5'-pyrrolidinyl)-3-methyl-3-pyrrolin-2-one, 1-(3'-methyl-2'-oxo-5'-pyrrolidinyl)-3-methyl-3-pyrrolin-2-one and its 5-hydroxy derivative isolated from seeds and characterised (*Collect. Czech. Chem. Commun.* 1988, 53, 157); aerial parts afforded 3,5,7,4'-tetrahydroxy-8-(3''-methylsuccinoyl) flavone (*Phytochemistry* 1988, 27, 1914).

NEW COMPOUNDS



Lilaline

L. hyacinthinum E.H. Wilson; see *Notholirion bulbiferum* (Lingelsh.) Stearn

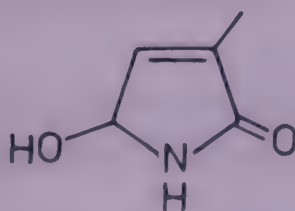
L. martagon L.

Eng. - Turk's cap lily.

A new alkaloid - lilidine - isolated from aerial parts and characterised as 5-hydroxy-3-methyl-3-en-pyrrolin-2-one (*Khim. Priir. Soedin.* 1987, 692; *Chem. Abstr.* 1988, 108, 164689 f).

Distribution : Grown in Indian gardens.

NEW COMPOUNDS



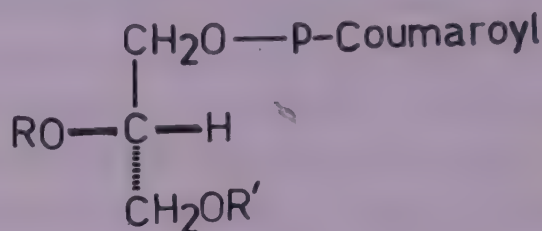
Lilidine

L. regale Wils.

Two new acylated glycerol glucosides - regalosides A and B - isolated from fresh bulbs and their structures elucidated (*Phytochemistry* 1988, 27, 451).

Distribution : Grown in Indian gardens.

NEW COMPOUNDS



Regalosite A

R = H, R' = Glu

Regalosite B

R = Glu, R' = Ac

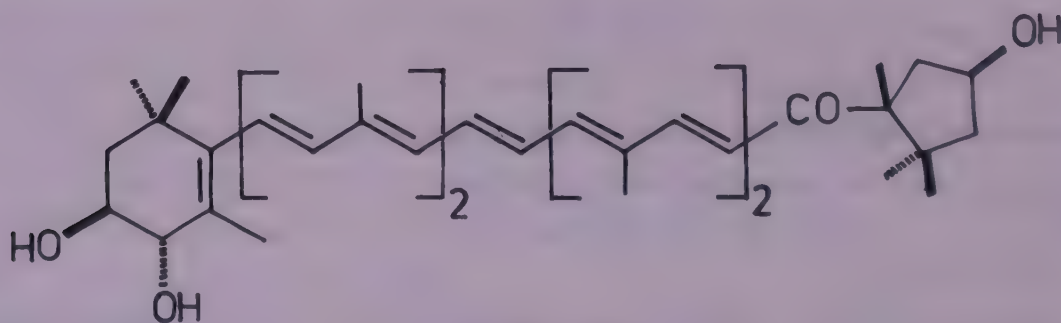
L. tigrinum Ker-Gawl.

Eng. - Red night, Tiger lily, Crumple lily.

Isolation of a new carotenoid - lilixanthin - along with (9Z)-, (9'Z)-, (13Z)- and (13'Z)-capsanthins, 6-epikarpoanthin and karpoanthin from petals and anthers (*Helv. Chim. Acta* 1985, 68, 1708).

Distribution : Native of China and Japan, introduced into gardens in India.

NEW COMPOUNDS



Lilixanthin

LIMNOPHILA (Scrophulariaceae)

L. aromatica (Lamk.) Merr. syn. *L. gratissima* Blume (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 154).

Isolation of a rare flavone - 7-desmethyartemetin - from aerial parts and its identification as 5,7-dihydroxy-3,6,3',4'-tetramethoxyflavone (*Fitoterapia* 1988, 59, 417).

L. gratissima Blume; see *L. aromatica* (Lamk.) Merr.

L. heterophylla (Roxb.) Benth. syn. *L. heterophylla* (Roxb.) Benth. var. *reflexa* (Benth.) Hook.f.

Determination of α -eudesmol (46.65), (+)limonene (38.84), (+)cadinene (6.19), α -pinene (3.92) and p-cymene (2.93%) as major constituents in essential oil (*Parfuem. Kosmet.* 1989, 70, 168; *Chem. Abstr.* 1989, 111, 83838 p).

Distribution : Throughout India, in plains.

L. heterophylla (Roxb.) Benth. var. *reflexa* (Benth.) Hook.f.; see *L. heterophylla* (Roxb.) Benth.

L. roxburghii G.Don; see *L. rugosa* (Roth) Merr.

L. rugosa (Roth) Merr. syn. *L. roxburghii* sensu Hook.f. (non G.Don) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 390).

Trans-anethole (76.39), estragole (21.94), humulene (0.15), linalool (0.08), caryophyllene (0.08), anisaldehyde (0.05), anisylacetone (0.03), cis-anethole (0.03) and α -bulnesene (0.01%) identified in essential oil by GC-MS (*Yunnan Zhiwu Yanjiu* 1986, 8, 103; *Chem. Abstr.* 1987, 107, 46035 w); a new flavone isolated from aerial parts and roots, characterised as 5-hydroxy-7,8,2',4'-tetramethoxyflavone (*Phytochemistry* 1989, 28, 1778).

LIMONIA (Rutaceae)

L. acidissima L.; see *Naringi crenulata* (Roxb.) Nicolson

L. alata Wall. ex Wt. & Arn.; see *Naringi alata* (Wall. ex Wt. & Arn.) Ellis

L. crenulata Roxb.; see *Naringi crenulata* (Roxb.) Nicolson

L. pubescens Wall. ex Hook.f.; see *Harrisonia perforata* (Blanco) Merr.

L. spectabilis Lindl.; see *Ravenia spectabilis* Engl.

LINARIA (Scrophulariaceae)

L. ramosissima Wall.; see *Kickxia ramosissima* (Wall.) Janchen

LINDENBERGIA (Scrophulariaceae)

L. muraria (Roxb. ex D.Don) Bruehl syn. *L. urticaefolia* Lehm.

Hydrocarbons (C₂₇-33), mannitol, apigenin, β -sitosterol, its glucoside and palmitate isolated (*Fitoterapia* 1986, 57, 377).

Distribution : Throughout plains of India, ascending to 1500 m in hills.

L. urticaefolia Lehm.; see *L. muraria* (Roxb. ex D.Don) Bruehl

LINDERA (Lauraceae)

L. neesiana (Nees) Kurz (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 154).

Isolation of succinic acid and β -sitosterol from stems (*Indian J. Chem.* 1989, 28B, 356).

LIPPIA (Verbenaceae)

L. citriodora H.B. & K.; see *Aloysia triphylla* (L'Herit.) Britton

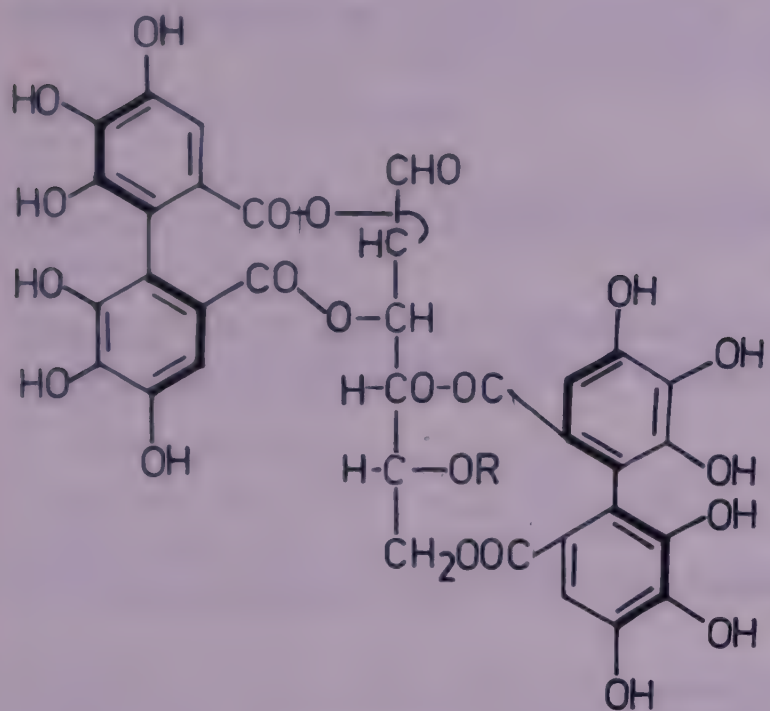
L. nodiflora Mich.; see *Phyla nodiflora* (L.) Greene

LIQUIDAMBAR (Altingiaceae)

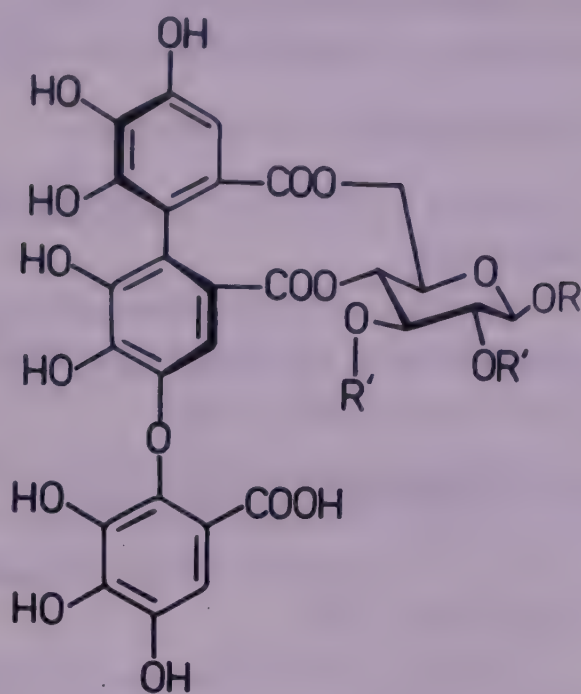
L. formosana Hance (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 392).

Two new acylated glycosides - myricetin-3-O-(6''-O-galloyl)glucoside and quercetin-3-O-(6''-O-galloyl)glucoside - isolated from leaves and characterised; astragalin, trifolin, isoquercitrin, hyperin, rutin, monotropein, myricetin-3-O-glucoside, ellagic acid and shikimic acid also isolated (*Shoyakugaku Zasshi* 1984, 38, 216; *Chem. Abstr.* 1985, 102, 119480 w); isolation of a new ellagitannin - liquidambin - from leaves and its structure elucidation as 5-O-galloyl-2,3,4,6-di-O-(S)hexahydroxydiphenoyl-D-glucose (*Phytochemistry* 1987, 26, 2053; *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1988, 30, 292; *Chem. Abstr.* 1989, 111, 93878 r); in addition, isorugosins A, B and D isolated from leaves and isorugosins A and D characterised (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1988, 30, 292; *Chem. Abstr.* 1989, 111, 93878 . *Chem. Pharm. Bull.* 1988, 36, 3920); characterisation of isorugosin B; orientation of the valoneoyl group in rugosins A and B established by ¹³C-NMR; rugosins D, E and G, coriariins C, D, E and F, cornusiin A and captothins A and B fully characterised (*Heterocycles* 1988, 27, 2081); a new triterpene acid - liquidambaric acid - isolated from fruits together with 24-ethyl cholest-5-en-3 β -ol (*Zhongcaoyao* 1988, 19, 342; *Chem. Abstr.* 1989, 110, 92120 e); three new compounds - (-)-bornyl cinnamate, styracin epoxide and isostyracin epoxide - isolated from fruits and characterised; betulonic acid also isolated (*Planta Med.* 1988, 54, 417).

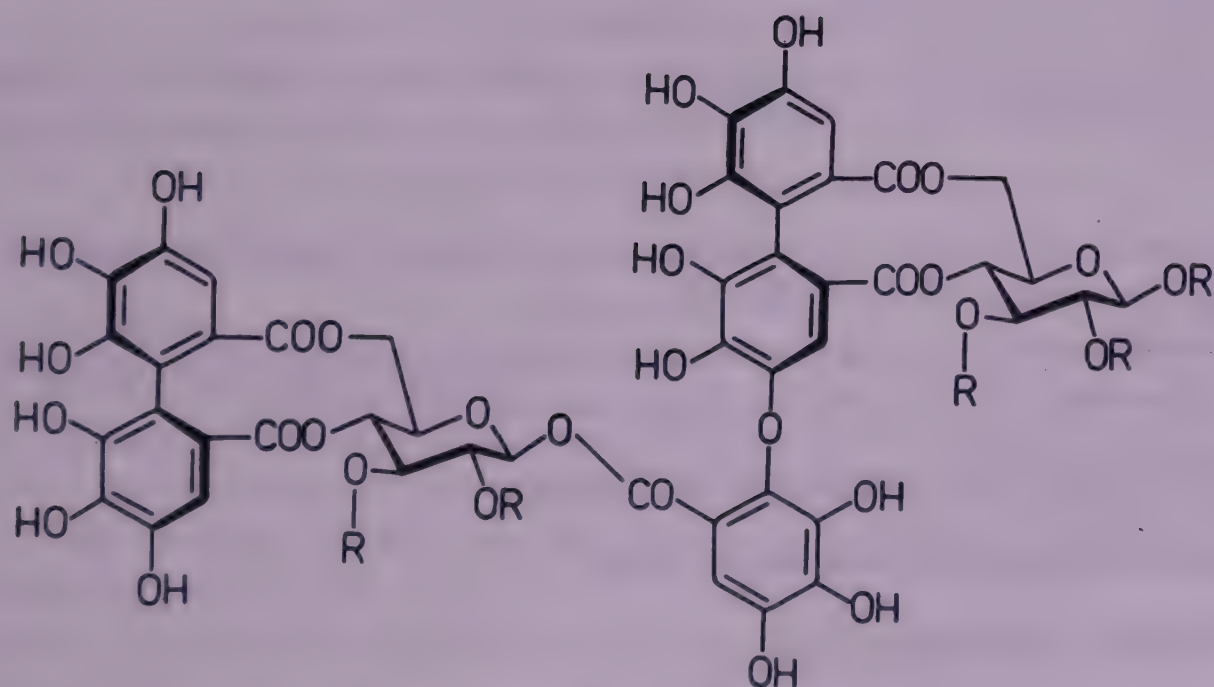
NEW COMPOUNDS



Liquidambin
R = Galloyl



Isorugosin A
R,R' = Galloyl
Isorugosin B
R = H, R' = Galloyl



Isorugosin D
R = Galloyl

BIOLOGICAL ACTIVITY

Betulonic acid showed remarkable protective activity against chemically-induced cytotoxicity in primary cultured rat hepatocytes (*Planta Med.* 1988, 54, 417).

LIRIODENDRON (Magnoliaceae)

L. tulipifera L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 392).

Isolation of N-methylaurotetanine and isocorypalmine from foliage (*Khim. Prir. Soedin.* 1986, 518; *Chem. Abstr.* 1986, 105, 222796 q); 2-C-methyl-D-erythritol isolated from leaves (*Phytochemistry* 1988, 27, 935).

LITHOSPERMUM (Boraginaceae)

L. arvensis L. (*arvense*) (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 247).

Caffeic, p-coumaric, ferulic, o-hydroxyphenylacetic, p-hydroxyphenylacetic, p-hydroxybenzoic, syringic and vanillic acids isolated from whole plant (*Herba Pol.* 1987, 33, 87; *Chem. Abstr.* 1988, 109, 187328 x).

LITSEA (Lauraceae)

L. deccanensis Gamble syn. *L. tomentosa* Heyne ex Hook.f. (non Blume) (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 421).

Isolation of (+)boldine, (+)corytuberine, (+)dicentrine, (+)isocorydine, (+)magnoflorine, (+)norboldine and (+)nordicentrine from leaves and stems (*Planta Med.* 1989, 55, 197).

L. monopetala (Roxb.) Pers. syn. *L. polyantha* Juss. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 394).

An arabinoxylan consisting of xylose and arabinose in a molar ratio of 1:2, isolated from leaves (*Carbohydr. Res.* 1986, 147, 165; *Chem. Abstr.* 1986, 104, 165357 a).

L. polyantha Juss.; see *L. monopetala* (Roxb.) Pers.

L. tomentosa Blume; see *L. deccanensis* Gamble

LIVISTONIA (Arecaceae)

L. chinensis R.Br. ex Mart. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 422).

Seed extract (0.2 ml) reduced metastatic activity of B16 melanoma F10 cells in mice *in vivo*; it increased spleen weight of treated mice and promoted spleen cell proliferation *in vitro* (*Bull. Inst. Zool., Acad. Sin.* 1987, 26, 143; *Chem. Abstr.* 1987, 107, 108919 y).

LOCHNERA (Apocynaceae)

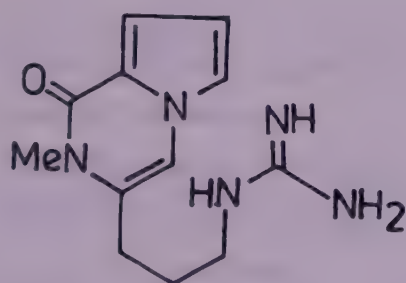
L. rosea (L.) Reichb.; see *Catharanthus roseus* (L.) G. Don

LOLIUM (Poaceae)

L. perenne L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 395).

Isolation of β -carboline (*Malays. J. Sci.* 1986, 8, 115; *Chem. Abstr.* 1987, 107, 205001 a); structure of peramine, previously isolated from *Acremonium loliae*-infected ryegrass, determined (*Chem. Commun.* 1986, 935).

NEW COMPOUNDS



Peramine

L. temulentum L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 156).

Isolation of loline and perloline from aerial parts (*Planta Med.* 1985, 51, 212).

LONICERA (Caprifoliaceae)

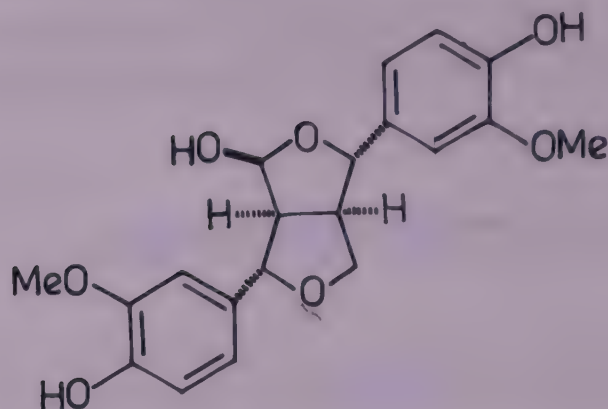
L. hypoleuca Decne.

P. - Kharmo, Kodi, Zhiko, Rapesho.

A new lignan (I) isolated from aerial parts and characterised as (-)-4-hydroxy-2,6-di-(4'-hydroxy-3'-methoxy)phenyl-3,7-dioxobicyclo(3.3.0)octane; its stereochemistry also established; n-nonacosan-10-ol, scopoletin, syringic acid, β -sitosterol and its glucoside also isolated (*Phytochemistry* 1985, 24, 628).

Distribution : Himalayas, from Kashmir to Kumaon, alt. 2100-3000 m.

NEW COMPOUNDS



I

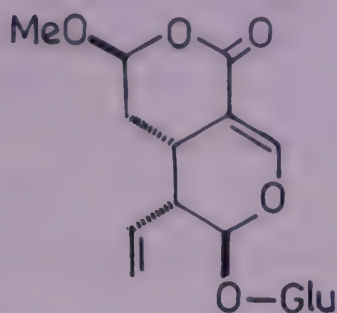
BIOLOGICAL ACTIVITY

β -Sitosterol- β -D-glucoside showed greater hypolipaeamic activity than β -sitosterol in rats with experimental hypercholesterolaemia; it decreased blood plasma cholesterol level (31.8%), compared to β -sitosterol (21.0%). Level of plasma phospholipids was not altered by β -sitosterol but glucoside increased it (27.0%), restoring a more normal plasma cholesterol and phospholipid ratio. In rats fed normal diet, plasma cholesterol and lipoprotein levels were not altered by β -sitosterol or its glucoside; plasma phospholipid levels were decreased by β -sitosterol (47.0%) more than by its glucoside (38.0%), resulting in a concomitant increase in plasma cholesterol and phospholipid ratio (*Farmakol. Toksikol. (Moscow)* 1982, 45, 45; *Chem. Abstr.* 1983, 98, 46750 w); β -sitosterol- β -D-glucoside exhibited spasmolytic activity (*Phytochemistry* 1985, 24, 628).

L. japonica Thunb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 396).

Contents of chlorogenic and isochlorogenic acids varied from (0.70-1.60) and (1.74-3.22%) respectively in flowers, leaves and stems (*Zhongyao Tongbao* 1985, 10, 223; *Chem. Abstr.* 1985, 103, 166000 v); isolation of a new iridoid glycoside - epivogeloside - along with secologanin dimethyl acetal, loganin and vogeloside; new compound characterised (*Chem. Pharm. Bull.* 1988, 36, 3664); four new saponins isolated from aerial parts and their structures elucidated as 3-O- α -L-arabinopyranosyl-28-O-[β -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranosyl]oleanolic acid, 3-O-[α -L-rhamnopyranosyl(1 \rightarrow 2)- α -L-arabinopyranosyl]-28-O-[β -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranosyl]oleanolic acid, 3-O-[α -L-rhamnopyranosyl(1 \rightarrow 2)- α -L-arabinopyranosyl]-28-O- β -glucopyranosylhederagenin and 3-O-[α -L-rhamnopyranosyl(1 \rightarrow 2)- α -L-arabinopyranosyl]-28-O-[6-acetyl- β -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranosyl]hederagenin (*Chem. Pharm. Bull.* 1988, 36, 4769); secoxyloganin isolated (*J. Nat. Prod.* 1988, 51, 319).

NEW COMPOUNDS



Epivogeloside

L. periclymenum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 396).

Isolation of secologanin, secoxyloganin, secologanoside and morroniside from stems (*Phytochemistry* 1984, 23, 2539).

LORANTHUS (Loranthaceae)

L. longiflorus Desr.; see *Dendrophthoe falcata* (L.f.) Etting.

LOTUS (Papilionaceae)

L. corniculatus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 396).

Kaempferol-3-glucosyl-7-rhamnoside and kaempferol-3,7-dirhamnoside isolated from seeds and aerial parts; in addition, seeds also afforded kaempferol-7-glucoside, quercetin-7-rhamnoside, quercetin-3-glucosyl-7-rhamnoside and quercetin-3,7-dirhamnoside (*Herba Pol.* 1984, 30, 151; *Chem. Abstr.* 1986, 104, 203832 m).

LUDWIGIA (Onagraceae)

L. hyssopifolia (G.Don) Exell; see *Fissendocarpa linifolia* (Vahl) Bennet

L. octovalvis (Jacq.) Raven (including ssp. *brevisepala* & ssp. *sessiliflora*) syn. *Jussiaea suffruticosa* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 146).

Orientin, isoorientin, vitexin and isovitexin isolated from plant grown in Taiwan (*Shih Ta Hsueh Pao Pao* (Taipei) 1985, 30, 547; *Chem. Abstr.* 1986, 104, 31779 f).

L. prostrata Roxb.

Mundari - Huring rangaini.

Triethyl chebulate and gallic acid isolated as antidysentery components; crystal structure of triethyl chebulate determined (*Zhongcaoyao* 1986, 17, 338; *Chem. Abstr.* 1987, 106, 23124 q).
Distribution : Plains of north India, Bengal, Manipur and Western Ghats, ascending upto 600 m in hills.

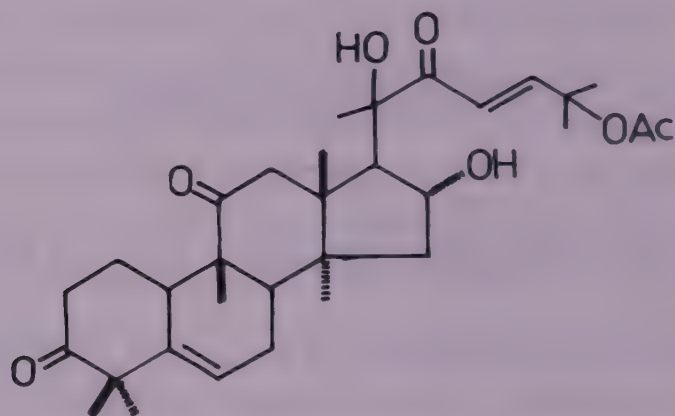
LUFFA (Cucurbitaceae)

L. acutangula (L.) Roxb.; see *L. acutangula* (L.) Roxb. var. *amara* (Roxb.) Clarke

L. acutangula (L.) Roxb. var. *amara* (Roxb.) Clarke syn. *L. acutangula* (L.) Roxb., *L. amara* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 396).

A new compound - amarinin - isolated from seeds and its structure elucidated as 2-deoxycucurbitacin B (*Plant Cell Physiol.* 1986, 27, 935; *Chem. Abstr.* 1986, 105, 168857 v).

NEW COMPOUNDS



Amarinin

BIOLOGICAL ACTIVITY

Amarinin inhibited growth of second leaf sheath of rice both in the absence and presence of GA3 (*Plant Cell Physiol.* 1986, 27, 935; *Chem. Abstr.* 1986, 105, 168857 v).

L. aegyptiaca Mill. ex Hook.f.; see *L. cylindrica* (L.) M. Roem.

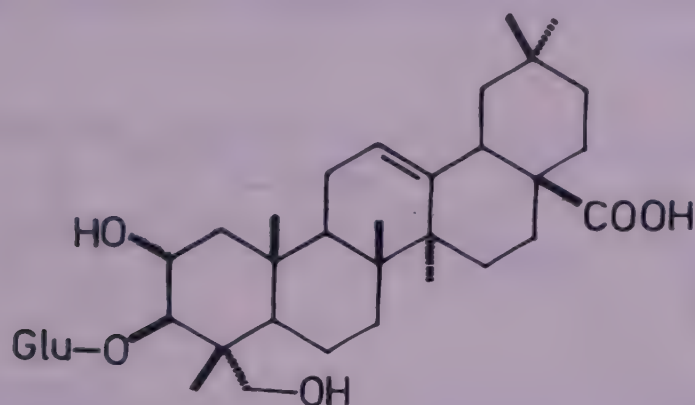
L. amara Roxb.; see *L. acutangula* (L.) Roxb. var. *amara* (Roxb.) Clarke

L. cylindrica (L.) M. Roem. syn. *L. aegyptiaca* Mill. ex Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 397).

Four new major saponins - lucyosides J, K, L & M - isolated from fruits and characterised as 3,28-O-bis- β -D-glucopyranosyl-21 β -hydroxygypsogenin, 3-O- β -D-glucopyranosylgypsogenin, 3-O- β -sophorosyl-28-O- β -D-glucopyranosylgypsogenin and 3-O-(6'-acetoxy- β -O-D-glucopyranosyl)-28-O- β -D-glucopyranosylgypsogenin respectively; lucyosides A, E and F, 3-O- β -D-glucopyranosylhederagenin and 3-O- β -D-glucopyranosyloleanolic acid also

isolated; a new minor saponin - lucyoside I - isolated from herb and characterised (*Yakugaku Zasshi* 1985, 105, 834; *Chem. Abstr.* 1986, 104, 95321 h); stigmasterol, campesterol, sitosterol, avenasterol, spinasterol, 25(27)-dehydroporiferasterol, 25(27)-dehydrochondrillasterol, 24 β -ethyl-25(27)-dehydrolathosterol, 24 ξ -methyllathosterol and 22-dihydrospinasterol identified in seeds (*Phytochemistry* 1986, 25, 2591).

NEW COMPOUNDS

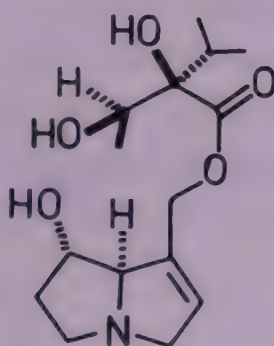


Lucyoside I

L. echinata Roxb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 425).

Crystal structure of echinatin determined (*Acta Crystallogr., Cryst. Struct. Commun.* 1988, 44C, 1478; *Chem. Abstr.* 1989, 111, 23765 c).

NEW COMPOUNDS



Echinatin

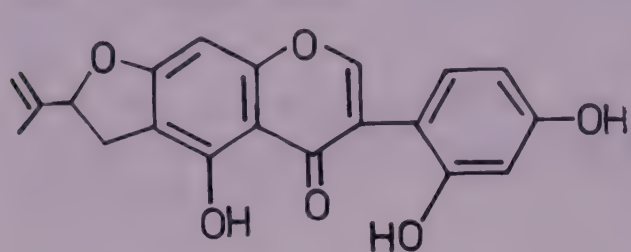
LUPINUS (Papilionaceae)

L. albus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 398).

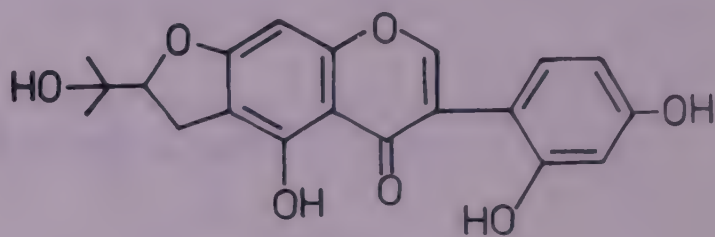
Fraction of seed extract showed antihyperglycaemic activity in glucose and diazoxide models; it also showed contractile effect on isolated rat duodenum and positive inotropic effect on isolated rat heart (*Plant. Med. Phytother.* 1984, 18, 237, 243; *Chem. Abstr.* 1985, 103, 444 t, 445 u).

Six new dihydrofuranoisoflavones - lupinisoflavones A, B, C, D, E and F - along with prenylated and pyranoisoflavones - wighteone, luteone, licoisoflavones A and B, lupalbigenin, 2'-hydroxylupalbigenin and parisoisoflavone B - isolated from roots (*Phytochemistry* 1984, 23, 1889); isolation of five new coumaronochromones - lupinalbins A, B, C, D and E - from roots together with erythrinin C; new compounds characterised (*Agric. Biol. Chem.* 1985, 49, 1775); isolation of a β -galactan from seeds (*Gazz. Chim. Ital.* 1985, 115, 535; *Chem. Abstr.* 1986, 104, 85382 q); total synthesis of lupinine and epilupinine (*J. Org. Chem.* 1988, 53, 3325).

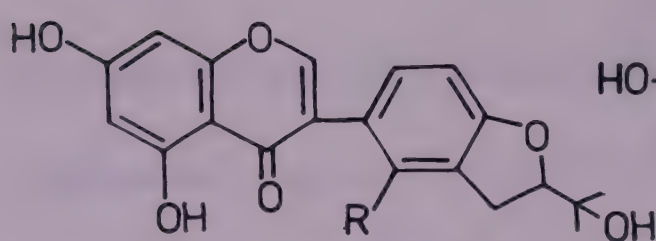
NEW COMPOUNDS



Lupinisoflavone A



Lupinisoflavone B

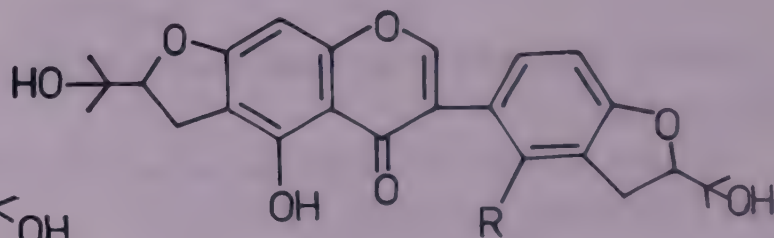


Lupinisoflavone C

R = H

Lupinisoflavone D

R = OH

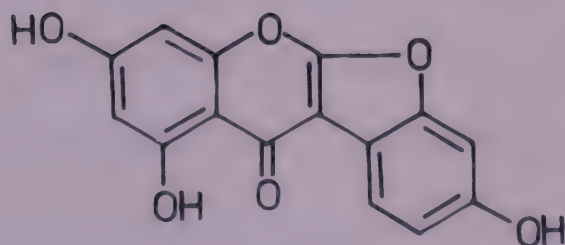


Lupinisoflavone E

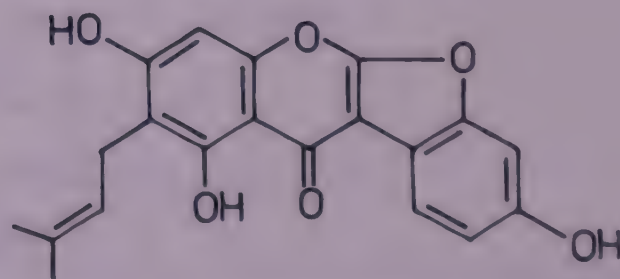
R = H

Lupinisoflavone F

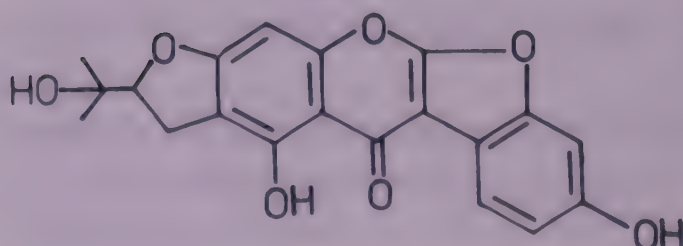
R = OH



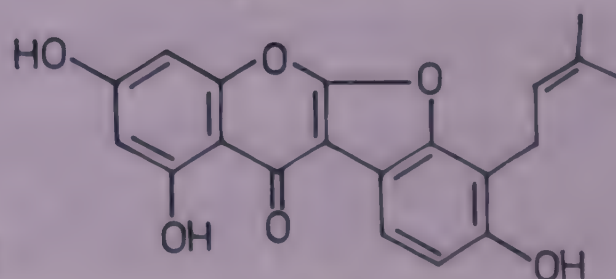
Lupinalbin A



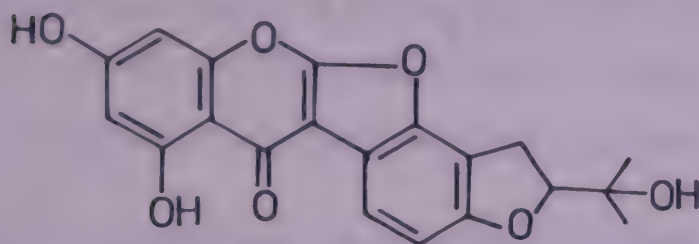
Lupinalbin B



Lupinalbin C



Lupinalbin D



Lupinalbin E

L. hartwegii L.

Eng. - Lupin.

Aphylline, lupanine, nuttalline and gramine identified in roots (*J. Indian Chem. Soc.* 1984, 61, 918).

Distribution : Introduced into India and grown in gardens.

L. hirsutus L.

Eng. - Blue lupin.

A new isoflavone isolated and characterised as 5,7,3'-trihydroxyisoflavone; apigenin, kaempferol and genistein also isolated (*Indian J. Chem.* 1985, 24B, 221).

Distribution : Native of Mediterranean region, introduced into Indian gardens.

LUVUNGA (Rutaceae)

L. scandens (Roxb.) Buch.-Ham. ex Wt. & Arn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 398).

Determination of 1,8-cineole (32.30), methyl cinnamate (14.50), camphor (9.75), car-3-ene (9.11), α -terpineol (5.60), α -pinene (3.20), linalool (3.12), borneol (3.12), eugenyl methyl ether (2.80), methylheptanone (2.60), β -ionone (2.00), myristicin (1.71), limonene (1.14), eugenol (0.83), camphene (0.23) and caryophyllene oxide (0.21%) in fruit pulp by GLC (*Seifen, Oele, Fette, Wachse* 1988, 114, 124; *Chem. Abstr.* 1988, 109, 79494 q).

LYCIUM (Solanaceae)

L. barbarum L. (*barbarium*) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 398).

Plant polysaccharides (LBP) partially restored the decreased splenic T-lymphocyte proliferation index of S180 tumor-bearing mice; a combination of cyclophosphamide (Cy) and LBP inhibited tumor growth about 3-fold than with Cy alone. Thus, LBP could both augment cellular immune function and inhibit tumor growth (*Zhongguo Yaolixue Yu Dulixue Zazhi* 1988, 2, 127; *Chem. Abstr.* 1988, 109, 47943 u).

Identification of scopoletin, vanillic acid and salicylic acid in leaves (*Zhongcaoyao* 1987, 18, 104, 133; *Chem. Abstr.* 1987, 107, 93549 b); quercetin and kaempferol isolated from leaves and flowers (*Geobios* 1988, 15, 32; *Chem. Abstr.* 1988, 109, 89702 v); atropine and hyoscyamine

determined in roots (0.42, 0.25), shoots (0.93, 0.33) and fruits (0.95, 0.29%) respectively (*Curr. Sci.* 1989, 58, 817).

L. europaeum L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 253).

Cycloartenol, lanosterol, stigmasterol and ursolic acid isolated (*J. Chem. Soc. Pak.* 1987, 9, 627; *Chem. Abstr.* 1988, 108, 147198 c).

LYCOPERSICON (LYCOPERSICUM) (Solanaceae)

L. esculentum Mill.; see *L. lycopersicum* (L.) Karsten

L. lycopersicum (L.) Karsten syn. *L. esculentum* Mill., *Solanum lycopersicum* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 399).

Extract of stems bearing primary crown gall tumors which were induced by *Agrobacterium tumefaciens*, exhibited pronounced cytokinin activity (*Plant Sci.* 1989, 61, 189; *Chem. Abstr.* 1989, 111, 93916 b).

5(Z)Lycopene isolated and its structure determined (*Helv. Chim. Acta* 1985, 68, 1540); lycopersiconol isolated from roots and characterised as $3\beta,16\beta$ -dihydroxy- 5α -pregnan-20-one (*Phytochemistry* 1988, 27, 3982); cytokinins - 6-benzylaminopurine, its 9β -ribofuranoside and a 9-hexoside - isolated from stems (*Plant Sci.* 1989, 61, 189; *Chem. Abstr.* 1989, 111, 93916 b).

LYCOPODIUM (Lycopodiaceae)

L. clavatum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 400).

Synthesis of lycopodine (*J. Am. Chem. Soc.* 1985, 107, 4341); a mixture of β -sitosterol, stigmasterol and brassicasterol (0.48:1.0:0.30) isolated; brassicasterol- β -D-glucoside also isolated (*Zhongcaoyao* 1987, 18, 530; *Chem. Abstr.* 1988, 108, 147157 p).

L. serratum Thunb.; see *Huperzia serrata* (Thunb.) Rothm.

LYCOPUS (Lamiaceae)

L. europaeus L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 428).

A trioxxygenated pimara-8(9),15-diene - methyl 1α -hydroxy- $7\alpha,14\beta$ -diacetoxypimarate - isolated and its structure determined (*Tetrahedron* 1985, 41, 357); p-coumaric, ferulic, p-hydroxybenzoic, p-hydroxyphenylacetic, sinapic, syringic and vanillic acids isolated from whole plant (*Herba Pol.* 1987, 33, 87; *Chem. Abstr.* 1988, 109, 187328 x).

LYCORIS (Amaryllidaceae)

L. radiata (L'Herit.) Herbert (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 400).

BIOLOGICAL ACTIVITY

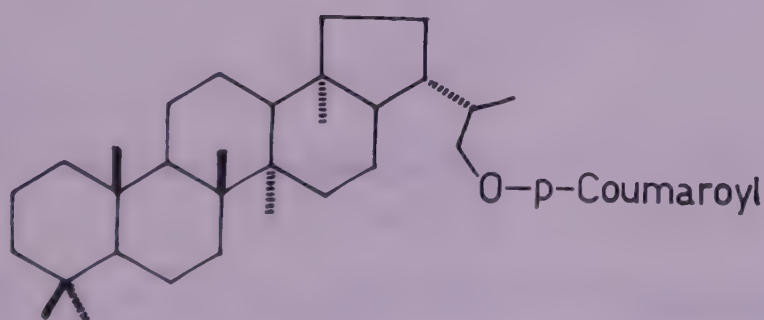
Lycorine-1-O- β -D-glucoside (20.0 μ g) induced extensive proliferation of murine splenic lymphocytes. Exposure of mouse splenic lymphocytes to it (10.0 μ g) for 72 hr caused proliferation of cells; however, increasing doses did not change the stimulation index (*Pharmazie* 1984, 39, 855; *Chem. Abstr.* 1985, 102, 105876 t).

LYGODIUM (Lygodiaceae)

L. flexuosum (L.) Sw. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 401).

Plant exhibited antifertility activity (*Planta Med.* 1986, 52, 329).

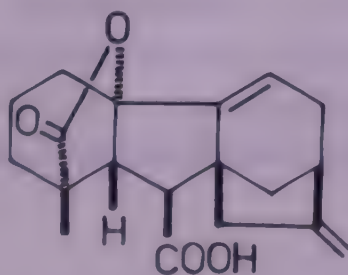
A new compound - O-p-coumaryldryocrassol - isolated together with dryocrassol, tectoquinone, kaempferol and its 3 β -D-glucoside, β -sitosterol and stigmasterol (*Planta Med.* 1986, 52, 329); isolation of quercetin and 3,5,7,3',4'-pentahydroxyflavone-3-O-rutinoside from roots (*Indian J. Nat. Prod.* 1988, 4(1), 17; *Chem. Abstr.* 1989, 110, 36733 v).

NEW COMPOUNDS

O-p-Coumaryldryocrassol

L. japonicum (Thunb.) Sw. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 158).

An antheridiogen isolated and characterised as methyl ester of new gibberellin GA73 (*Tetrahedron Lett.* 1988, 29, 3959).

NEW COMPOUNDS

GA73

BIOLOGICAL ACTIVITY

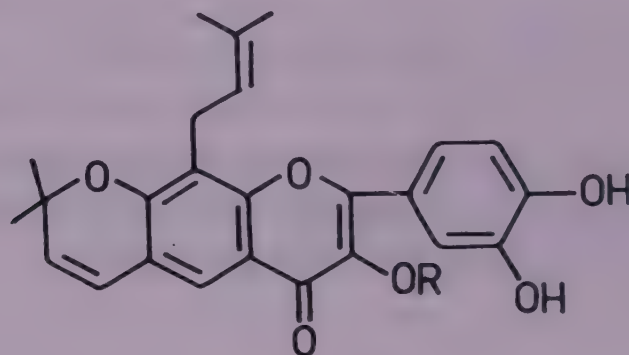
GA73 methyl ester induced antheridium formation and dark spore germination at 1.0 pM and 1.0 pM, respectively whereas at 1.0 pM it inhibited archegonial formation (*Tetrahedron Lett.* 1988, 29, 3959).

MACARANGA (Euphorbiaceae)

M. indica Wight (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi 1956, p. 158).

Isolation and structure determination of two new chromenoflavones - macaflavone I and macaflavone II - from leaves (*Phytochemistry* 1986, 25, 953); a new flavanone isolated from leaves and characterised as 6,7-dimethoxy-3',4'-methylenedioxyflavanone; sumatrol and 7-methyltectorigenin also isolated (*Indian J. Chem.* 1987, 26B, 801).

NEW COMPOUNDS



Macaflavone I

R = H

Macaflavone II

R = Me

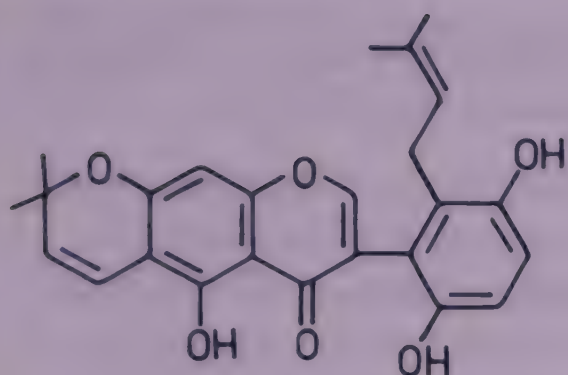
MACLURA (Urticaceae)

M. aurantiaca Nutt.; see *M. pomifera* (Rafin.) C.K. Schum.

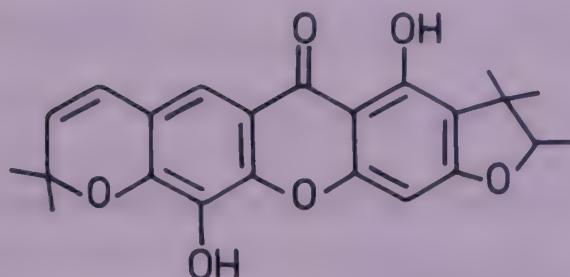
M. cochinchinensis (Lour.) Corner syn. *Cudrania javanensis* Hook.f. p.p., *C. cochinchinensis* (Lour.) Kudo & Masam. ex Sauer. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 431).

Isolation and characterisation of cudraiso flavone A along with 3-O-methylorobol, dehydrocostus lactone, methyl linoleate and sitosterol (*Phytochemistry* 1988, 27, 951); four new prenylated xanthenes - gerontoxanthenes A, B, C and D - isolated from root bark and their structures elucidated; cudraxanthone A and osajaxanthone also isolated from root bark (*Phytochemistry* 1989, 28, 595).

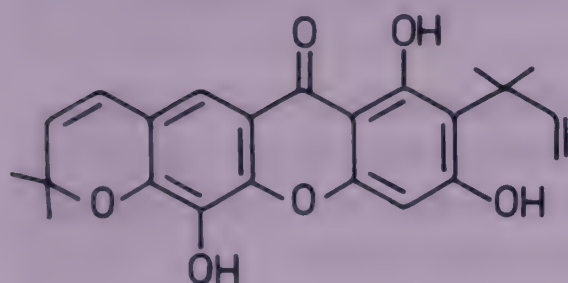
NEW COMPOUNDS



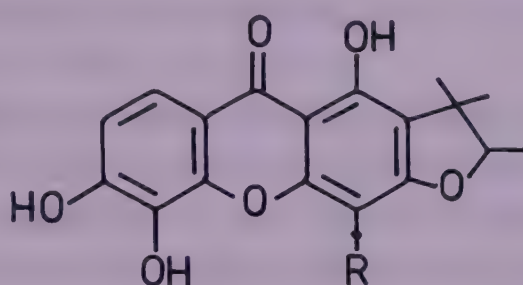
Cudraiso flavone A



Gerontoxanthone A



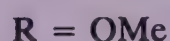
Gerontoxanthone B



Gerontoxanthone C



Gerontoxanthone D



BIOLOGICAL ACTIVITY

Cudraiso flavone A was found to be cytotoxic to PS cells *in vitro* (*Phytochemistry* 1988, 27, 951).

M. pomifera (Rafin.) C.K. Schum. syn. *M. aurantiaca* Nutt. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 402).

A new xanthone - 8-prenyltoxyloxanthone C - isolated from root bark along with euchrestaflavanones B and C; structure of new compound determined (*Phytochemistry* 1984, 23, 1489); root bark afforded macluraxanthone (0.19), alvaxanthone (0.06), osajaxanthone (0.02), 6-deoxyjacareubine (0.006) and tovoxanthone (0.001%) (*Khim. Prir. Soedin.* 1989, 429; *Chem. Abstr.* 1989, 111, 191472 y).

MACROPANAX (Araliaceae)

M. dispermus (Bl.) Kuntze syn. *M. oreophilus* Miq. (*oreophilum*)

Khasi - Dieng-arasi.

3 β -Hydroxyolean-12-en-28-O- β -D-glucopyranoside, oleanolic acid and hederagenin isolated from leaves (*Phytochemistry* 1989, 28, 644).

Distribution : Himalayas, from Kumaon to Bhutan, Assam and Meghalaya, alt. 1000-2000 m.

M. oreophilus Miq.; see *M. dispermus* (Bl.) Kuntze

MACROTOMIA (Boraginaceae)

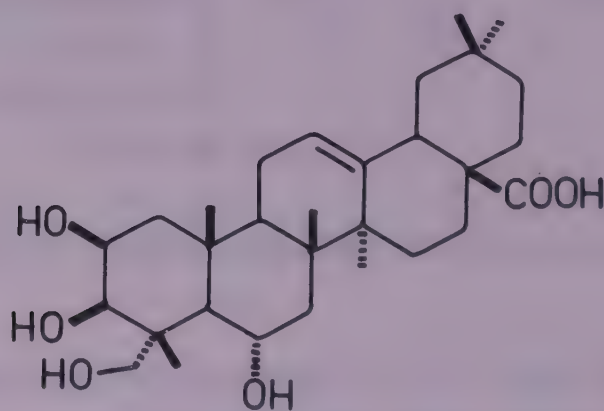
M. perennis (Schrenk) Boiss.; see *Arnebia euchroma* (Royle) Johnston

MADHUCA (Sapotaceae)

M. butyracea (Roxb.) Macbride syn. *Bassia butyracea* Roxb., *Diploknema butyracea* (Roxb.) Lamk. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 432).

A new triterpenoid sapogenin - butyric acid - isolated from leaves and characterised (*Planta Med.* 1985, 51, 280); isolation of quercetin, myricetin and their 3-O-rhamnosides from flowers (*Fitoterapia* 1986, 57, 128); flowers afforded β -amyrin acetate, friedelin, erythrodiol monopalmitate, β -sitosterol and α -spinasterol (*Fitoterapia* 1987, 58, 285).

NEW COMPOUNDS



Butyric acid

M. indica J.F.Gmel.; see *M. longifolia* (Koen.) Macbride

M. latifolia (Roxb.) Macbride; see *M. longifolia* (Koen.) Macbride

M. longifolia (Koen.) Macbride syn. *M. latifolia* (Roxb.) Macbride, *M. indica* J.F.Gmel., *Bassia latifolia* Roxb., *B. longifolia* Koen. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 403).

Leaf saponin showed moderate spasmolytic activity but no spermicidal activity.

Aglycone of leaf saponin characterised as protobassic acid (*Fitoterapia* 1985, 56, 186).

MAESA (Myrsinaceae)

M. dubia (Wall.) DC.; see *M. indica* (Roxb.) DC. var. *indica*

M. indica (Roxb.) DC.; see *M. montana* A.DC.

M. indica (Roxb.) DC. var. *angustifolia* Hook.f. & Thoms.

Glycosidal fraction of leaves showed anti-inflammatory, analgesic and antipyretic activities; aglycone mixture from glycosidal fraction had mild tranquillizing activity but had no effect on cardiovascular system in mice and rats (*Indian J. Exp. Biol.* 1987, 25, 826).

Saponin fraction from leaves on acid hydrolysis yielded camelliagenin A and its 22 α ,28-glycoaldehyde acetal, 16 α -O-acetyl-22 α -O-angeloylcamelliagenin A and 16 α -O-acetyl-22 α -O-(2'-methylbutyroyl)camelliagenin A (*Phytochemistry* 1987, 26, 2345).

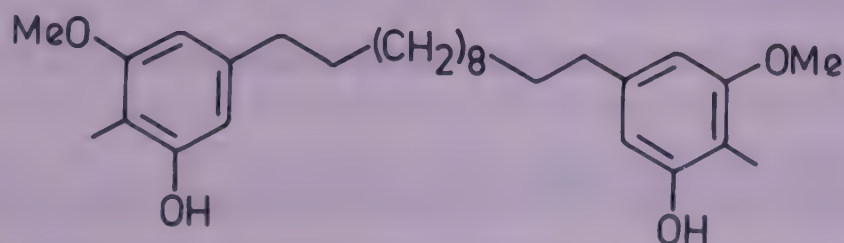
Distribution : Himalayas, Nepal eastwards ascending upto 2100 m.

Note : In Hook.f. Fl. Brit. India 3:509, no varieties are described under *Maesa chisia* Ham. ex Don., however, var. *angustifolia* Hook.f. & Thoms mentioned under *M. indica* (Roxb.) DC. It appears that in the ref. (*Indian J. Exp. Biol.* 1987, 25, 826) cited above, authors have not provided correct name of the species. It has, therefore, been corrected as *M. indica* (Roxb.) DC. var. *angustifolia* Hook.f. & Thoms.

M. indica (Roxb.) DC. var. *indica* syn. *M. dubia* (Wall.) DC. p.p., *M. indica* (Roxb.) DC. var. *perrottetiana* (DC.) Cl. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 434).

Plant extract showed strong inhibition of mutagenic activity of 2-aminoanthracene towards *Salmonella typhimurium* (T-98).

A new dimeric phenol - maesol - isolated from seeds and its structure determined (*J. Nat. Prod.* 1988, 51, 1226).

NEW COMPOUNDS

Maesol

M. indica (Roxb.) DC. var. *perrottetiana* (DC.) Cl.; see *M. indica* (Roxb.) DC. var. *indica*

M. montana A. DC. syn. *M. indica* sensu Hook.f. [non (Roxb.) DC.] p.p.

Plant extract strongly inhibited 2-aminoanthracene (mutagen) activity towards *Salmonella typhimurium* (T-98).

Maesol isolated from seeds (*J. Nat. Prod.* 1988, 51, 1226).

Distribution : Throughout India, ascending to 1800 m in hills.

MAGNOLIA (Magnoliaceae)

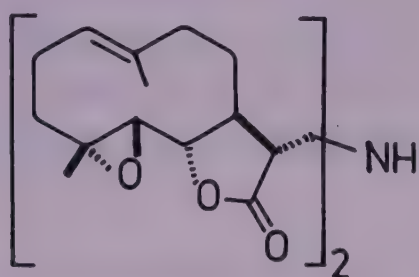
M. baillonii Pierre syn. *Talauma phellocarpa* King, *Paramichelia baillonii* (Pierre) Hu

Assam - khorika-sopa, Tita-sopa, Dieng-lari, Dieng-rewi; Garo - Bol-mring; Mikir - Langla-chikong-arong.

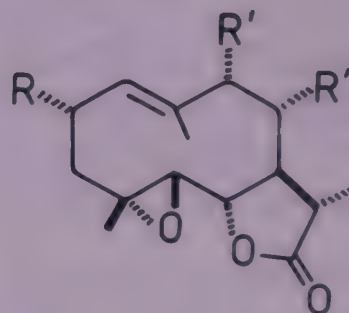
Isolation and structure determination of a new germacranolide alkaloid - (-)bisparthenolidine - from bark; (-)parthenolide, (-)dihydroparthenolide and liriodenine also isolated (*J. Nat. Prod.* 1987, 50, 891); three new germacranolides - (-)9 α -hydroxydihydroparthenolide, 2 α -hydroxydihydroparthenolide and its 8 α -acetoxy derivative (paramicholide) - isolated from bark and their structures elucidated (*J. Nat. Prod.* 1988, 51, 163).

Distribution : Assam and Meghalaya, upto 1200 m.

NEW COMPOUNDS



(-)Bisparthenolidine



(-)9 α -Hydroxydihydroparthenolide

R, R'' = H, R' = OH

2 α -Hydroxydihydroparthenolide

R = OH, R', R'' = H

Paramicholide

R = OH, R' = H, R'' = OAc

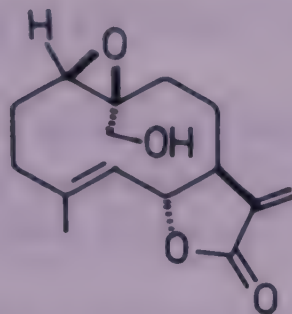
BIOLOGICAL ACTIVITY

(-)Bisparthenolidine showed antitumor activity in KB cell culture (*J. Nat. Prod.* 1987, 50, 891).

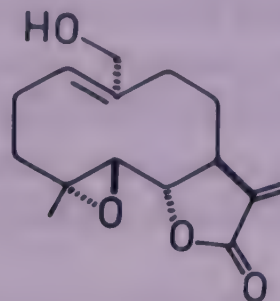
M. grandiflora L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 403).

Two isomeric melampolides - melampomagnolide A and melampomagnolide B - isolated from leaves and their structures established (*Phytochemistry* 1984, 23, 2372); magnolol synthesised (*Hua Hsueh* 1985, 431; *Chem. Abstr.* 1986, 105, 152803 p); stereoselective synthesis of costunolide (*J. Org. Chem.* 1986, 51, 4315; *Chem. Lett.* 1986, 85; *Chem. Abstr.* 1987, 106, 33338 b).

NEW COMPOUNDS



Melampomagnolide A



Melampomagnolide B

M. insignis Wall. syn. *Manglietia insignis* (Wall.) Blume, *M. insignis* (Wall.) Blume var. *latifolia* Hook.f. & Thoms.

Total alkaloid content of bark 0.80%; eudesmol, honokiol, magnocurarine and magnolol isolated from bark (Zhongyao Tongbao 1985, 10, 370; Chem. Abstr. 1986, 104, 24115 h).

Distribution : Nepal, alt. 1800-3000 m and Khasia Hills, alt. 900-1800 m.

MAJORANA (Lamiaceae)

M. hortensis Moench syn. *Origanum majorana* L. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 404).

Essential oil was remarkably effective against fungi (Essent. Oils Aromat. Plants, Proc. Int. Symp. 15th, 1984, 209; Chem. Abstr. 1986, 104, 10348 z).

Structure of majoranin revised as 5,6,4'-trihydroxy-7,8,3'-trimethoxyflavone (Phytochemistry 1984, 23, 2973); carvacrol and thymol identified as main components in essential oil of plant grown in Turkey (Essent. Oils Aromat. Plants, Proc. Int. Symp. 15th, 1984, 209; Chem. Abstr. 1986, 104, 10348 z); determination of carvacrol (30.12), α -terpinene (19.15), linalool (13.23), geraniol (7.59), p-cymene (2.45), thymol (1.6) and α -terpineol (0.25%) in essential oil (1.9%) (Indian Perfum. 1985, 29, 171; Chem. Abstr. 1986, 104, 230240 y); arbutin, methylarbutin and their aglycones, hydroquinone and hydroquinone monomethyl ether isolated; estimation of arbutin by chromatophotometric and HPLC techniques (Planta Med. 1987, 53, 343); detection of terpin-1-en-4-ol (23.5), cis-sabinene hydrate (21.5), trans-sabinene hydrate (4.4), linalool (2.5), α -terpineol (3.9) and β -terpineol (0.8%) in oil of Moroccan plant by GC-MS (Biruniya 1988, 4, 27; Chem. Abstr. 1988, 109, 176061 d).

BIOLOGICAL ACTIVITY

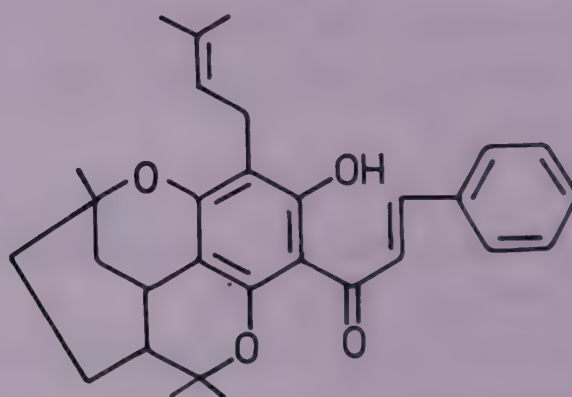
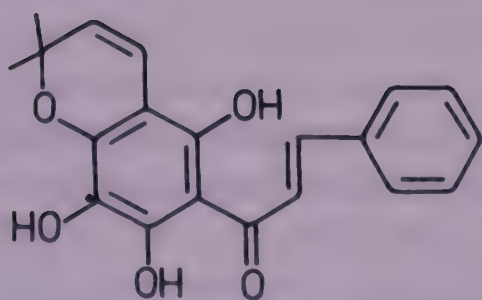
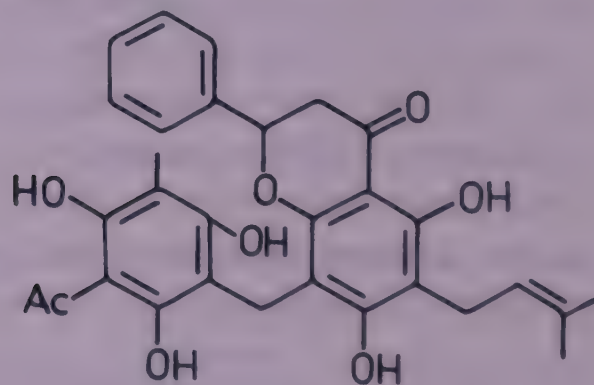
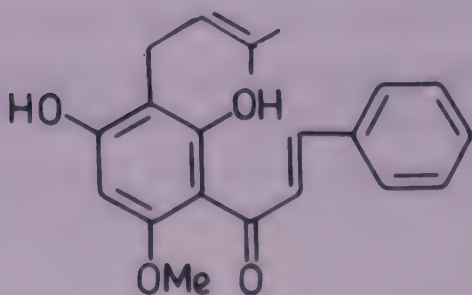
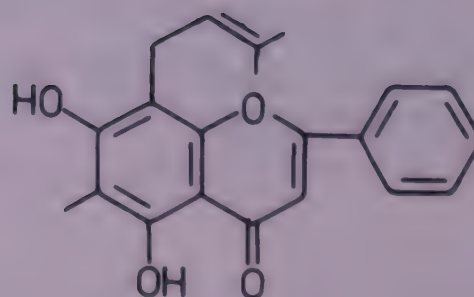
Hydroquinone showed potent cytotoxic activity against cultured rat hepatoma cells (Planta Med. 1987, 53, 343).

MALLOTUS (Euphorbiaceae)

M. philippinensis (Lam.) Muell.-Arg. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 405).

Aqueous extract of red resinous powder (0.03 g) showed lithotropic effect in adult albino rats which was comparable to that of cystone (10.0 mg). Stone formation was induced by insertion of zinc pellets in urinary bladder of adult rats (*J. Res. Ayurveda & Siddha* 1989, 10, 175).

Five new flavanoids - mallotus A, mallotus B, 3'-prenylrubranine, 2',4'-dihydroxy-6'-methoxy-3'-prenylchalcone (I) and 5,7-dihydroxy-6-methyl-8-prenylflavone (II) - isolated and their structures determined (*Indian J. Chem.* 1988, 27B, 238).

NEW COMPOUNDS**3'-Prenylrubranine****Mallotus A****Mallotus B****I****II**

MALUS (Rosaceae)

M. baccata (L.) Borkh. syn. *Pyrus baccata* L., *Malus baccata* (L.) Borkh. var. *himalaica* (Maxim.) Schneid.

H. - Ban mehal, Gwalam; Eng. - Siberian crab apple, Himalayan crab apple; Khasia - Sohshurum; P. - Baror, Katsbal, Liu, Lhizo.

Phloretamide [3-(p-hydroxyphenyl)-propionic acid amide] isolated from fruits (*Biochem. Physiol. Pflanz.* 1986, 181, 131; *Chem. Abstr.* 1986, 104, 17712 x).

Distribution : Himalayas from Kashmir to Bhutan, alt. 1800-3600 m, Meghalaya, alt. 1500-1800 m.

M. baccata (L.) Borkh. var. *himalaica* (Maxim.) Schneid.; see *M. baccata* (L.) Borkh.

M. communis DC.; see *M. pumila* Mill.

M. domestica Borkh.; see *M. pumila* Mill.

M. pumila Mill. syn. *M. sylvestris* Hort. (non Mill.), *M. communis* DC., *M. domestica* Borkh., *Pyrus malus* L. p.p. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 406).

Friedelin, apigenin, its 7-O-glucoside, quercetin, its 3-O-glucoside, aromadendrin-3-O-glucoside, luteolin and sitosterol isolated from heartwood (*Indian J. Pharm. Sci.* 1984, 46, 189); phloretamide isolated from fruits (*Biochem. Physiol. Pflanz.* 1986, 181, 131; *Chem. Abstr.* 1986, 104, 17712 x).

M. sylvestris Mill.; see *M. pumila* Mill.

MALVA (Malvaceae)

M. sylvestris L. syn. *M. sylvestris* L. var. *mauritiana* (DC.) Masters (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 406).

A new anthocyanin isolated and characterised as malvidin-3-(6''-malonylglucosido)-5-glucoside (*Phytochemistry* 1989, 28, 499).

M. sylvestris L. var. *mauritiana* (DC.) Masters; see *M. sylvestris* L.

M. verticillata L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 161).

A neutral polysaccharide - MVS-1 - from seeds composed of arabinose, galactose and glucose in molar ratio of 3:6:7, respectively (*Chem. Pharm. Bull.* 1987, 35, 4981); pectic peptidoglycan - MVS-V - isolated from seeds composed of protein (57.0) and polysaccharide (43.0%); polysaccharide moiety consisted of galacturonic acid, arabinose, xylose, galactose and rhamnose in molar ratio of 24:6:5:3:8 respectively (*Chem. Pharm. Bull.* 1988, 36, 2790).

MALVAVISCUS (Malvaceae)

M. conzattii Greenm. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 407).

Chronic administration of plant extract (2.5 g/kg) to rat elevated serum glutamate oxaloacetate transaminase (SGOT) level and reduced glycogen content without any change in histological appearance of liver. Oral LD50 was 56.76 g/kg in male mice (*Indian J. Pharmacol.* 1986, 18, 117).

Betaine isolated from flowers (*Indian J. Med. Res.* 1988, 88, 458).

BIOLOGICAL ACTIVITY

Betaine showed sperm immobilizing action *in vitro* (*Indian J. Med. Res.* 1988, 88, 458).

MAMMEA (Clusiaceae)

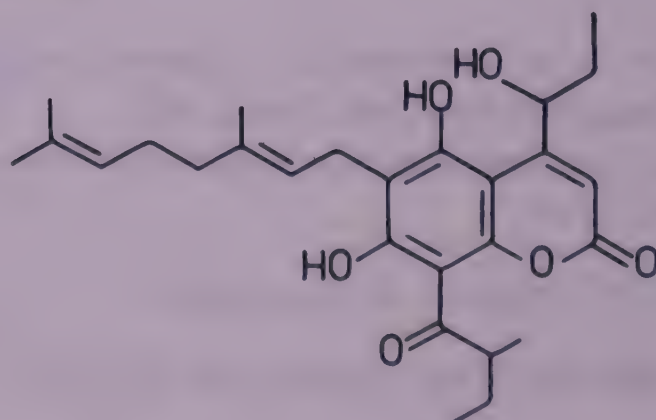
M. americana L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 440).

¹³C-NMR spectra of mammeigin studied (*Rev. Latinoam. Quim.* 1987, 18, 134; *Chem. Abstr.* 1988, 109, 92560 c).

M. longifolia Planch. ex Triana; see *M. suriga* (Ham. ex Roxb.) Kosterm.

M. suriga (Ham. ex Roxb.) Kosterm. syn. *M. longifolia* Planch. ex Triana (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 407).

A new coumarin - surangin C - isolated from bark and its structure determined (*Phytochemistry* 1986, 25, 555).

NEW COMPOUNDS

Surangin C

MANGIFERA (Anacardiaceae)

M. indica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 407).

The fatty acids of seed kernel contained stearic and oleic acids (86.0%) as major compounds along with arachidic, linoleic, linolenic and palmitic acids (*Bangladesh J. Sci. Ind. Res.* 1983, 18, 146; *Chem. Abstr.* 1985, 103, 120003 v); 5-[2(Z)-heptadenyl]resorcinol identified in latex (*J. Agric. Food Chem.* 1985, 33, 377; *Chem. Abstr.* 1985, 102, 201116 r); six new tetracyclic triterpenoids - cycloart-24-en-3 β ,26-diol, 3-ketodammar-24(E)-en-20S,26-diol and C-24 epimers of cycloart-25-en-3 β ,24,27-triol and cycloartan-3 β ,24,25-triol - isolated from stem bark and characterised; cycloartenol, 3 β -hydroxycycloart-24-en-26-al, 24-methylene-cycloartan-3 β ,26-diol, C-24 epimers of cycloart-25-en-3 β -24-diol and α -amyrin, β -amyrin, dammarenediol II, ψ -taraxastane-3 β ,20-diol, ocotillol, methyl mangiferonate, methyl mangiferolate, methyl isomangiferolate and sitosterol also isolated (*Phytochemistry* 1985, 24, 2359); isolation of a mixture of 5-(12-cis-heptadecenyl)- and 5-pentadecyl-resorcinols from fruits (*Phytochemistry* 1986, 25, 1093); threonine, alanine, valine, tryptophan, glucose, galactose and arabinose identified in flowers (*Pakistan J. Sci. Ind. Res.* 1988, 31, 833; *Chem. Abstr.* 1989, 110, 209347 c); a new pentacyclic triterpenoid - hopan-1 β ,3 β ,22-triol - and four new tetracyclic triterpenoids - 3 α ,22(R/S)-, 3 β ,22(R/S)-, 3 β ,23(R/S)- and 3 α ,27-dihydroxycycloart-24(E)-en-26-oic acids - isolated from stem bark and their structures elucidated (*Phytochemistry* 1989, 28, 1471).

BIOLOGICAL ACTIVITY

Mixture of 5-(12-cis-heptadecenyl)- and 5-pentadecyl-resorcinol showed fungicidal activity against *Alternaria alternata*, responsible for black spot disease of mango fruit in Israel (*Phytochemistry* 1986, 25, 1093); dose-dependent stimulation of proliferation of thymocytes and splenic lymphocytes observed after 48 hr exposure to mangiferin; peak response to thymocytes was observed at 5.0 μ g/ml whereas peak response to splenic lymphocytes was observed at 20.0 μ g/ml (*Pharm. Res.* 1986, 3, 307; *Chem. Abstr.* 1987, 106, 12564 g).

MANGLIETIA (Magnoliaceae)

M. insignis (Wall.) Blume; see *Magnolia insignis* Wall.

M. insignis (Wall.) Blume var. *latifolia* Hook.f. & Thoms.; see *Magnolia insignis* Wall.

MAPPIA (Icacinaceae)

M. foetida (Wt.) Miers; see *Nothapodytes nimmoniana* (Graham) Mabberley

M. oblonga Miers var. *elliptica* Miers; see *Nothapodytes nimmoniana* (Graham) Mabberley

M. ovata Miers; see *Nothapodytes nimmoniana* (Graham) Mabberley

M. tomentosa Miers; see *Nothapodytes nimmoniana* (Graham) Mabberley

M. platycahlyx (Baker) Sprague syn. *Dolichandrone platycahlyx* Baker

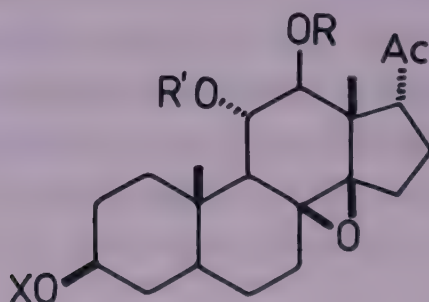
Distribution : Native of tropical Africa, grown in Indian gardens.

M. begoniaefolia Roxb.; see *Alangium chinense* (Lour.) Harms

M. tenacissima (Roxb.) Moon (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 410).

Five new glycosides - tenacissosides A, B, C, D and E - isolated from stems and characterised as 3-O- β -D-glucopyranosyl(1 \rightarrow 4)-3-O-methyl-6-deoxy- β -D-allopyranosyl(1 \rightarrow 4)- β -D-oleandropyranosides of tencigenins BI, BII, BIII, BIV and BV respectively (*Phytochemistry* 1986, 25, 2861).

NEW COMPOUNDS



X = Oleandrose(4→1)-3-O-methyl-6-deoxyallose(4→1)Glu

Tenacissoside A

$$R = \text{Tigloyl}, R' = \text{Ac}$$

Tenacissoside B

$$R,R' = \text{Tigloyl}$$

Tenacissoside C

R = Tigloyl, R' = Benzoyl

Tenacissoside D

R = Tigloyl, R' = 2-Me Butyryl

Tenacissoside E

R = 2-Me Butyl, R' = Benzoyl

MATRICARIA (Asteraceae)

M. chamomilla L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 411).

Bisabolol, its oxides A and B, chamazulene, farnesene and spathulenol identified in oil of cultivated Cuban plant (*Rev. Cubana Farm.* 1984, 18, 303; *Chem. Abstr.* 1985, 103, 109754 v); isolation of bisabolol oxide, borneol, caryophyllene, chamazulene, 1,8-cineole, farnesene, linalool, myrcene, pulegone and α -terpineol from oil (*Essenze Deriv. Agrum.* 1985, 55, 52; *Chem. Abstr.* 1986, 105, 84920 x).

MAYTENUS (Celastraceae)

M. ovatus (Wall. ex Wt. & Arn.) Loesener syn. *Gymnosporia ovata* (Wt. & Arn.) Lawson (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 413).

Maytansine synthesised (*Sci. Sin.* 1988, 31B, 1342; *Chem. Abstr.* 1989, 111, 173853 u).

BIOLOGICAL ACTIVITY

Maytansine (0.1 mg/kg, i.p.) administered to mice on day four after inoculation with Ehrlich ascites carcinoma cells produced mitotic arrest of cells (*Zhongguo Yaoli Xuebao* 1985, 6, 63; *Chem. Abstr.* 1985, 102, 178832 k).

MEDICAGO (Papilionaceae)

M. denticulata Willd.; see *M. polymorpha* L.

M. hispida Gaertn.; see *M. polymorpha* L.

M. lupulina L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 269).

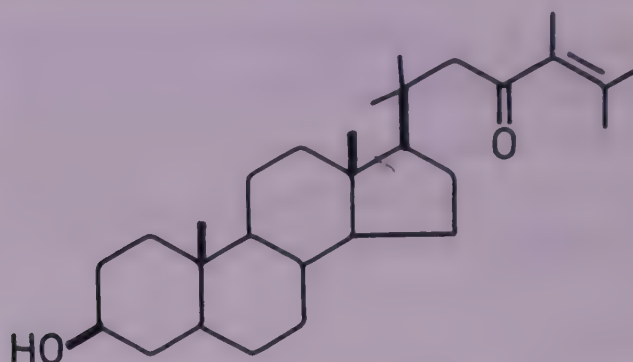
Saponin fraction showed fungicidal, haemolytic and piscicidal activities (*Acta Soc. Bot. Pol.* 1984, 53, 527; *Chem. Abstr.* 1985, 103, 68278 x).

Acid hydrolysis of saponins yielded two new aglycones - soyasapogenol An and soyasapogenol N - along with soyasapogenols B, C, D, E and F, medicagenic acid and rhamnose, xylose, arabinose, glucose, galactose and glucuronic acid (*Acta Soc. Bot. Pol.* 1984, 53, 515, 527; *Chem. Abstr.* 1985, 103, 68277 w, 68278 x); isolation of soyasaponin I, hederagenin-3-O- β -D-glucopyranoside, medicagenic acid-3-O- β -D-glucopyranoside and medicagenic acid-3,28-di-O- β -D-glucopyranoside from roots (*J. Sci. Food. Agric.* 1988, 43, 289; *Chem. Abstr.* 1989, 110, 170184 v).

M. polymorpha L. syn. *M. denticulata* Willd., *M. hispida* Gaertn. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 450).

A new sterol - medipolymorphol - isolated and its structure established (*Indian J. Chem.* 1988, 27B, 860).

NEW COMPOUNDS



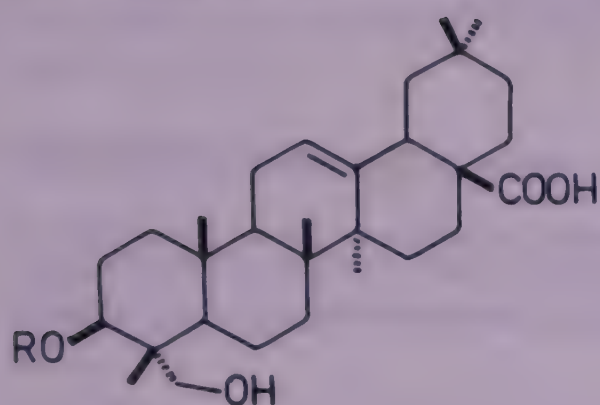
Medipolymorphol

M. sativa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 415).

Seed extract significantly reduced total cholesterol, phospholipids, triglycerides, LDL-cholesterol and VLDL-cholesterol in chicks. Simultaneously, increase in HDL-cholesterol/total cholesterol ratio occurred with reduction in total cholesterol and phospholipid contents of liver and ventricular muscle of heart. Thus, alfalfa was effective in both hyperlipidaemia and atherosclerosis (*Indian J. Physiol. Pharmacol.* 1985, 29, 47).

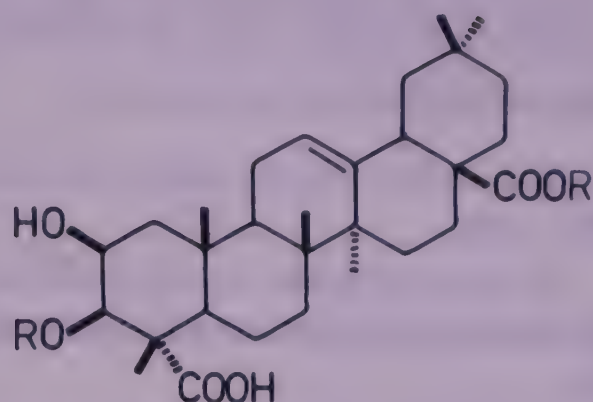
Isolation and structure elucidation of triterpene glycoside - medicoside C - from roots; cauloside C also isolated (*Khim. Prir. Soedin.* 1985, 805; *Chem. Abstr.* 1986, 105, 3494 m); another new triterpene glycoside - medicoside G - from roots and its structure determined (*Khim. Prir. Soedin.* 1984, 451; *Chem. Abstr.* 1985, 102, 16999 t); an improved method for isolation of medicagenic acid-3-O- β -D-glucopyranoside from roots developed (*J. Agric. Food Chem.* 1986, 34, 960; *Chem. Abstr.* 1986, 105, 206283 q); seeds afforded caproic, lauric, isopentadecanoic, palmitic, isopalmitic and oleic acids (*Egypt. J. Pharm. Sci.* 1986, 27, 79; *Chem. Abstr.* 1987, 106, 210997 p); soyasapogenols A, B, C and E, hederagenin, bayogenin, medicagenic acid and zanhic acid obtained by hydrolysis of saponins; five prosapogenins containing medicagenic acid, zanhic acid, glucose, sophorose and glucuronic acid also identified in saponin hydrolysate (*J. Agric. Food Chem.* 1988, 36, 902; *Chem. Abstr.* 1988, 109, 125817 x); a new glucuronide saponin - dehydrosoyasaponin I - and two glycerol-glycolipids isolated from aerial parts together with soyasaponin I, azukisaponin II and azukisaponin V; glycerol-glycolipids contained linolenoyl, linoleoyl, palmitoyl (2.0%), oleoyl or stearoyl (2.0%) residues (*Yakugaku Zasshi* 1988, 108, 547; *Chem. Abstr.* 1988, 109, 196979 n).

NEW COMPOUNDS



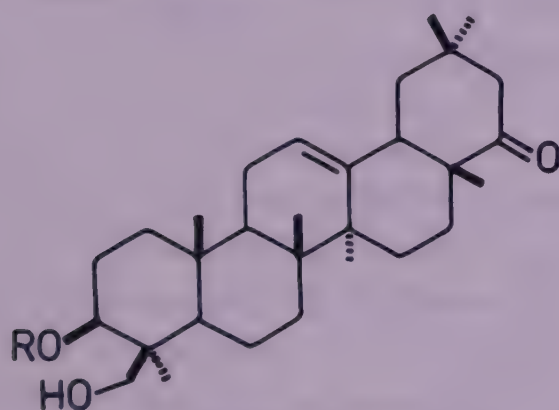
Medicoside C

R = Ara(2→1)Glu(2→1)Ara



Medicoside G

R = Glu



Dehydrosoyasaponin I

R = Gluc.acid(2→1)Glu(2→1)Rha

BIOLOGICAL ACTIVITY

Medicagenic acid-3-O- β -D-glucopyranoside at 40.0 μ g/ml showed fungicidal activity against *Trichoderma viride*, *Sclerotium rolfsii*, *Rhizopus mucco*, *Aspergillus niger*, *Phytophthora cinnamomi* and *Fusarium oxysporum* f. sp. *lycopersici* by inhibiting mycelial growth by 95.0, 86.0, 68.0, 53.0, 51.0 and 52.0% respectively (*J. Agric. Food Chem.* 1986, 34, 960; *Chem. Abstr.* 1986, 105, 206283 q).

MELALEUCA (Myrtaceae)

M. leucadendron (L.) L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 451).

Essential oil exhibited anti-inflammatory, analgesic, antifebrile, antibacterial and expectorant activities (*Rev. Pharm.* 1985, 76; *Chem. Abstr.* 1987, 107, 289 d).

1,8- α -Cineole (48.0), p-cymene (13.2), α -terpineol (9.8), limonene (4.8), α -pinene (3.8), linalool (3.4), β -pinene (2.6) and terpinen-4-ol (1.6%) determined in leaf essential oil of Vietnamese plant; phellandrene, isopropylanisole, carveol, α -copaene, β -elemene, humulene

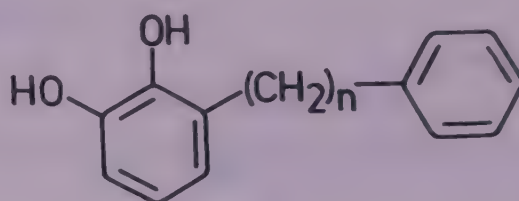
and γ -cadinene also identified in oil (*Tap Chi Duoc Hoc* 1984, 19; *Chem. Abstr.* 1985, 103, 42458 f; *Perfum. Flavor.* 1988, 13, 17; *Chem. Abstr.* 1988, 109, 43348 f).

MELANORRHOEA (Anacardiaceae)

M. usitata Wall. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 451).

Two phenolic lipids - 3-(12-phenyldodecyl)catechol (I) and 3-(10-phenyldecyl)catechol (II) - isolated from Burmese plant and their structures determined (*Chem. Commun.* 1985, 630).

NEW COMPOUNDS



I

n = 10

II

n = 12

MELASMA (Scrophulariaceae)

M. avense (Benth.) Hand.-Mazz. syn. *Alectra indica* Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 416).

Hydroxy- β -ionone glucoside and aucubigenin-1-O- β -D-gentiobioside isolated (*Yunnan Zhiwu Yanjiu* 1987, 9, 103; *Chem. Abstr.* 1987, 107, 112693 n).

MELASTOMA (Melastomaceae)

M. malabathricum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 416).

Arginine, aspartic acid, glutamic acid, glycine, hydroxyproline, leucine, isoleucine, methionine, serine, tyrosine and valine isolated from leaves (*J. Indian Chem. Soc.* 1985, 62, 789); isolation of two new compounds - octyl docosanoate and 11-methyl-1-tritriacontanol from aerial parts and their characterisation (*J. Indian Chem. Soc.* 1986, 63, 764); aerial parts afforded behenic, lauric, lauroleic, linoleic, myristic, myristoleic, oleic, palmitic and stearic acids and campesterol, cholesterol, β -sitosterol and stigmasterol (*J. Indian Chem. Soc.* 1988, 65, 144); a new flavonol diglycoside isolated from aerial parts and characterised as quercetin-3-O- α -L-rhamnosyl(1 \rightarrow 2)- β -D-galactoside (*J. Indian Chem. Soc.* 1988, 65, 209); a new alcohol -

32-methyl-1-tritriacontanol - isolated from leaves along with ursolic acid and β -sitosterol whereas flower yielded kaempferol and p-hydroxybenzoic and gallic acids (*J. Indian Chem. Soc.* 1988, 65, 385).

MELIA (Meliaceae)

M. azadirachta L.; see *Azadirachta indica* (L.) A. Juss.

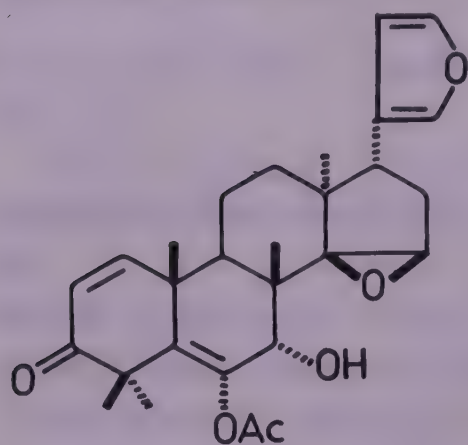
M. azedarach L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 417).

Fruit extract exhibited significant stimulant action on central nervous system. Motor activity of rats was increased. It also caused convulsion and had anorexigenic activity. Extract showed positive inotropic effect on frog heart and produced contraction of smooth muscle of intestine (*J. Res. Ayurveda & Siddha* 1981, 2, 260); leaf extract potentiated pentobarbitone-induced hypnosis in mice, lowered activity in open field and decreased conditioned avoidance response, indicating CNS depressant properties. It showed analgesic action, potentiated haloperidol-induced catatonia, reduced immobility of rats and enhanced exploratory activity, but, like other CNS depressants, it reduced seizures (*Indian J. Pharmacol.* 1989, 21, 46).

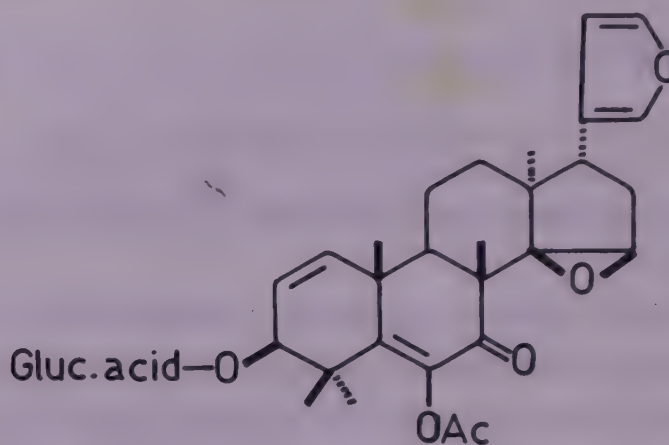
A new flavone glycoside isolated from stem bark and characterised as 5,4'-dihydroxy-flavone-7-O- α -L-rhamnopyranosyl(1 \rightarrow 4)- β -D-glucopyranoside (*Curr. Sci.* 1984, 53, 694); isolation and structure determination of a new limonoid - 6-acetoxy-7 α -hydroxy-3-oxo-14 β ,15 β -epoxymeliacin-1,5-diene (I) - and a new limonoid glycoside - 6-acetoxy-3 β -hydroxy-7-oxo-14 β ,15 β -epoxymeliacin-1,5-diene-3-O- β -D-glucuronopyranoside (II) - from roots; salannin also isolated (*Indian J. Chem.* 1985, 24B, 166); two new anthraquinone glycosides - 1,8-dihydroxy-2-methylanthraquinone-3-O- β -D-galactopyranoside and 1,5-dihydroxy-8-methoxy-2-methylanthraquinone-3-O- α -rhamnopyranoside - isolated from stem bark (*Indian J. Chem.* 1985, 24B, 793); isolation of isochuanliansu from bark and its structure determination (*Yaoxue Xuebao* 1985, 20, 188; *Chem. Abstr.* 1985, 103, 92693 z); roots afforded apigenin-5-O- β -D-galactopyranoside (*Curr. Sci.* 1985, 54, 570); a new limonoid glycoside - 7 α -acetoxy-14 β ,15 β -epoxygedunan-1-ene-3-O- β -D-glucopyranoside (III) - isolated from stem bark and characterised (*Indian J. Chem.* 1986, 25B, 1087); isolation and structure elucidation of 6-acetoxy-11 α -hydroxy-7-oxo-14 β ,15 β -epoxymeliacin-1,5-diene-3-O- α -L-rhamnopyranoside (IV) from seeds; salannin and meldenin also isolated (*J. Nat. Prod.* 1986, 49, 56); determination of kaempferol-3-O- β -D-rutinoside (0.14) and quercetin-3-O- β -D-rutinoside (0.08%) in leaves (*J. Nat. Prod.* 1986, 49, 170); isolation of another new limonoid glycoside - 6,11-di-acetoxy-7-oxo-14 β ,15 β -epoxymeliacin-1,5-diene-3-O- β -D-glucopyranoside (V) - from seeds and its structure determination (*Planta Med.* 1987, 53, 100); a new tetranortriterpenoid - 1-cinnamoylmelianolone - isolated from fruits and its structure elucidated (*Tetrahedron Lett.* 1987, 28, 3543); 6-acetoxy-3 β -hydroxy-7-oxo-14 β ,15 β -epoxymeliacin-1,5-diene-3-O- β -D-

xylopyranoside (VI) isolated from seeds and characterised (*Proc. Natl. Acad. Sci. India* 1988, 58A, 33; *Chem. Abstr.* 1989, 110, 228592 v).

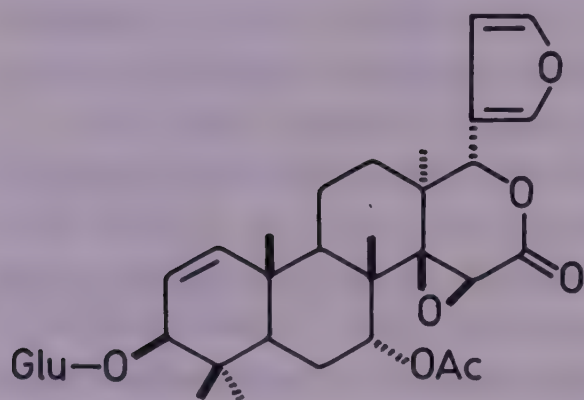
NEW COMPOUNDS



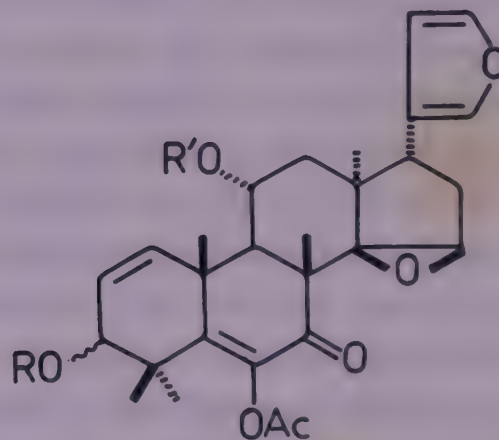
I



II



III

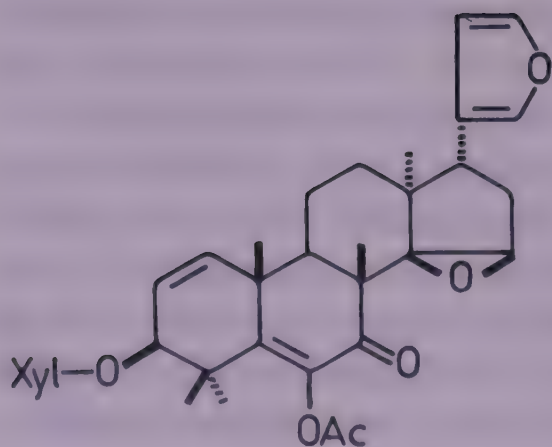


IV

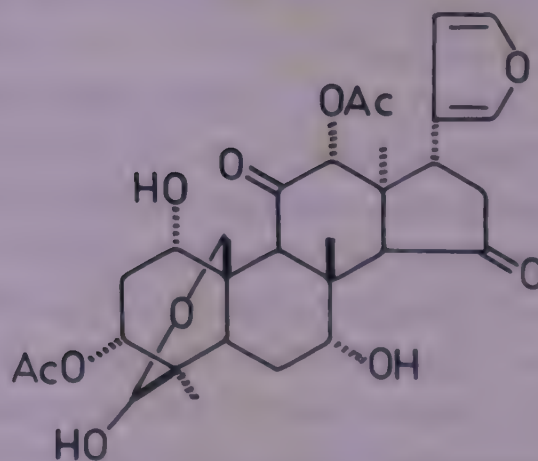
R = Rha, R' = H, ~ = α

V

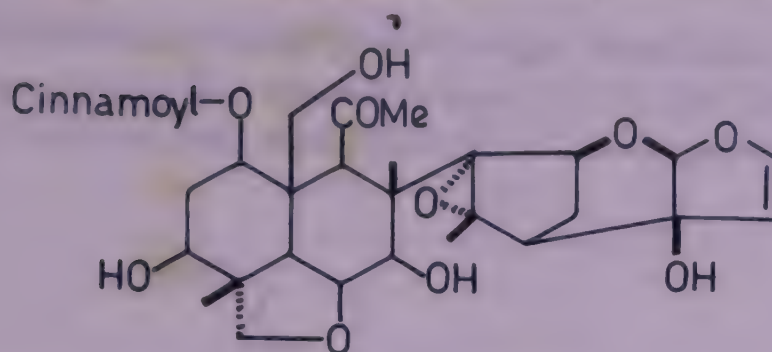
R = Glu, R' = Ac, ~ = β



VI



Isochuanliansu



1-Cinnamoylmelianolone

BIOLOGICAL ACTIVITY

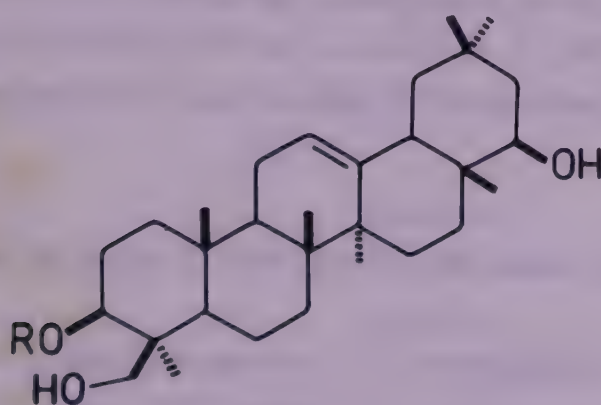
Limonoid glycoside (IV) showed antibacterial activity (*J. Nat. Prod.* 1986, 49, 56).

M. indica Brandis; see *Azadirachta indica* (L.) A. Juss.

MELILOTUS (Papilionaceae)

M. indica (L.) All. (*indicus*) syn. *M. parviflora* Desf. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 452).

A new saponin (I) isolated and characterised as 3-O-[α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranosyl]soyasapogenol B carboxylate; azukisaponin II, robinin and clovin also isolated (*Arch. Pharmacol Res.* 1988, 11, 197; *Chem. Abstr.* 1989, 110, 128241 m).

NEW COMPOUNDS

I

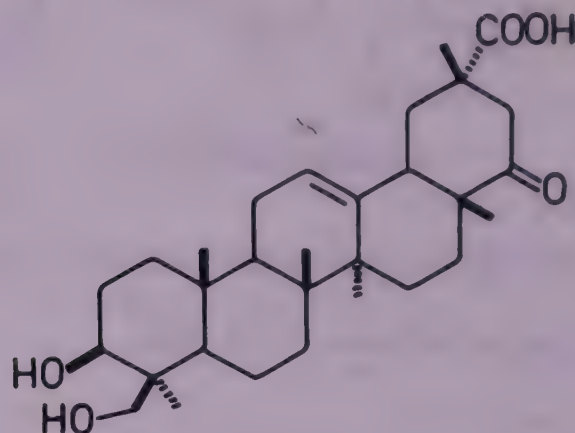
R = Gluc.acid(2 \rightarrow 1)Glu(2 \rightarrow 1)Rha**BIOLOGICAL ACTIVITY**

Saponin (I) inhibited leucocyte migration in inflammation (*Arch. Pharmacol Res.* 1988, 11, 197; *Chem. Abstr.* 1989, 110, 128241 m).

M. officinalis (L.) Medik. ex Desr. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 452).

A new sapogenin - melilotigenin - isolated from dried leaves and flowers and its structure determined (*J. Nat. Prod.* 1988, 51, 335); a galactomannan isolated from seeds and partially characterised (*Carbohydr. Res.* 1988, 173, 159; *Chem. Abstr.* 1988, 109, 51657 w).

NEW COMPOUNDS



Melilotigenin

M. parviflora Desf.; see *M. indica* (L.) All.

MELINIS (Poaceae)

M. minutiflora Beauv.

Eng. - Molasses grass, Stink grass.

Arachidic, behenic, lauric, linoleic, linolenic, myristic, oleic, palmitic and stearic acids and campesterol, cholesterol, lupeol, β -sitosterol, stigmasterol and β -carotene isolated (*Rev. Colomb. Cienc. Quim.-Farm.* 1986, 15, 83; *Chem. Abstr.* 1986, 105, 206296 w).

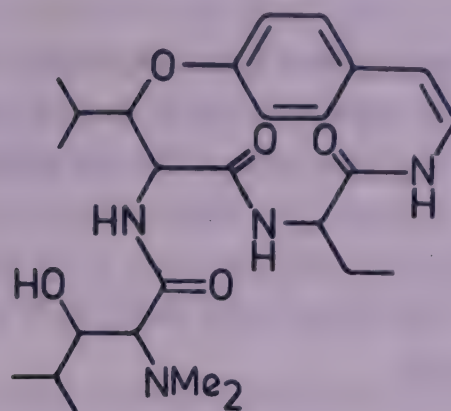
Distribution : Native of Africa, introduced into India in Assam and south India as fodder grass.

MELOCHIA (Sterculiaceae)

M. corchorifolia L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 453).

Isolation and structure determination of 6-methoxy-3-propenyl-2-pyridine carboxylic acid from aerial parts (*Chem. Ind.* 1986, 464); linoleic (56.5), oleic (18.5), palmitic (15.0), stearic (4.6), sterculic (1.9), arachidic (1.0), behenic (0.9), malvalic (0.9) and myristic (0.7%) acids determined in essential oil by GC (*J. Oil Technol. Assoc. India* 1986, 18, 91; *Chem. Abstr.* 1987, 107, 194888 s); a new cyclopeptide alkaloid - melofoline - isolated along with adouetine Y' and characterised (*Phytochemistry* 1987, 26, 324); 24-ethyl-2-methyltritetracont-1-en-3,23-diol, 27-methyloctacosane-1,3-diol and nonacosyl non-4-enoate isolated from aerial parts and their structures determined; β -amyrin, ethyl stearate, friedelin, friedelinol, robinin, β -sitosterol, its stearate and glucoside, tetratriacontanol and vitexin also isolated (*Indian J. Chem.* 1987, 26B, 1161).

NEW COMPOUNDS



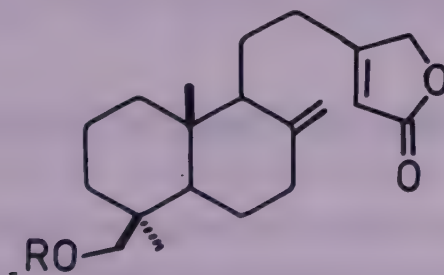
Melofoline

MELODINUS (Apocynaceae)

M. monogynus Roxb. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 271).

A new labdane diterpene - medigenin - and its glycoside - medinin - isolated from root bark and characterised as 16,19-dihydroxy-entlabda-8(17)13-dien-15-oic lactone and its 19-O- β -cellobioside respectively (*Phytochemistry* 1988, 27, 2255).

NEW COMPOUNDS



Medigenin

R = H

Medinin

R = Cellobiose

MENTHA (Lamiaceae)

M. aquatica L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 454).

Carvone, isomenthone, limonene, linalool, linalyl acetate, α -pinene and pulegone present in essential oil of plant grown in Uruguay (*An. R. Acad. Farm.* 1985, 51, 333; *Chem. Abstr.* 1985, 103, 165911 f).

M. arvensis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 420).

Essential oil from Vietnamese plants found to contain menthol (15.6-45.0), menthone (12.5-26.0), pulegone (8.2-26.0), piperitone oxide (3.2-14.5) and piperitenone oxide (2.6-22.8%) (*Rastit. Resur.* 1986, 22, 96; *Chem. Abstr.* 1986, 104, 155687 u); determination of linalool (48.5), geraniol (10.3), α - and β -citral (6.2), linalyl acetate (5.3), geranyl acetate (4.6), nerol (3.3), α -pinene (1.62), citronellol (1.48), limonene (1.0), β -pinene (0.65) and piperitone (0.5%) in essential oil by GC (*Izv. Acad. Nauk Mold. SSR, Ser. Biol. Khim. Nauk* 1989, 75; *Chem. Abstr.* 1989, 111, 191519 u).

BIOLOGICAL ACTIVITY

(-)-Menthol markedly increased bile excretion in rats (*Shoyakugaku Zasshi* 1985, 39, 93; *Chem. Abstr.* 1985, 103, 134463 g).

M. longifolia (L.) Huds. syn. *M. sylvestris* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 421).

Eucalyptol, piperitenone oxide, piperitone oxide and α -terpineol identified in oil (*Biruniya* 1985, 1, 15; *Chem. Abstr.* 1985, 103, 165910 e); (R)(-)-carvone isolated from leaf essential oil (*Flavour Fragrance J.* 1987, 2, 95; *Chem. Abstr.* 1988, 109, 20290 s); hesperetin-7-rutinoside, 3'-hydroxy-5,6,7,4'-tetramethoxyflavone, luteolin, β -sitosterol and ursolic acid isolated; ¹³C-NMR of hesperetin-7-rutinoside (*Orient. J. Chem.* 1988, 4, 281; *Chem. Abstr.* 1989, 110, 92048 n).

M. piperita L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 421).

Essential oil inhibited muscular contraction of electrically-stimulated guinea pig ileum possibly due to presence of pinene (*Fitoterapia* 1988, 59, 463).

Isolation of 5,6-dihydroxy-7,8,3',4'-tetramethoxyflavone from leaves along with 5-hydroxy-6,7,8,4'-tetramethoxyflavone, 5-hydroxy-6,7,8,3',4'-pentamethoxyflavone, 5,3'-dihydroxy-6,7,8,4'-tetramethoxyflavone, 5,4'-dihydroxy-6,7,8-trimethoxyflavone and 5,3',4'-trihydroxy-6,7,8-trimethoxyflavone (*Phytochemistry* 1984, 23, 2972); 7-O-rutinosides of eriodictyol and luteolin isolated from leaves (*Planta Med.* 1984, 50, 361); menthol (42.5), menthone (27.3), neomenthone (7.0), cineole (6.6), menthyl acetate (6.2), neomenthol (5.3), isomenthol (3.1), limonene (0.25) and pinene (0.23%) estimated in oil (*Fitoterapia* 1988, 59, 463); menthone (37.8), menthol (26.5) and pulegone (1.20%) found to be major constituents in essential oil of Belorussian plant (*Vestsi Akad. Navuk BSSR, Ser. Biyal. Navuk* 1989, 11; *Chem. Abstr.* 1989, 111, 191523 r).

M. pulegium L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 455).

Carvone, isomenthone, limonene, linalool, linalyl acetate, α -pinene and pulegone present in essential oil of Uruguayan plant (*An. R. Acad. Farm.* 1985, 51, 333; *Chem. Abstr.* 1985, 103, 165911 f); camphene, p-cymene, isomenthol, limonene, menthone, menthofuran, methyl acetate, 1-methyl cyclohexanol, neomenthol, octan-3-ol, phellandrene and α - and β -pinenes identified in essential oil from Chilean plant by GLC (*Ann. Pharm. Fr.* 1986, 44, 133; *Chem. Abstr.* 1986, 105, 139401 m).

M. spicata L. syn. *M. viridis* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 422).

Identification of carvone, isomenthone, limonene, linalool, linalyl acetate, α -pinene and pulegone in essential oil of Uruguayan plant (*An. R. Acad. Farm.* 1985, 51, 333; *Chem. Abstr.* 1985, 103, 165911 f); carvone present as major constituent in oil of cultivated Italian plant (*Flavour Fragrance J.* 1986, 1, 105; *Chem. Abstr.* 1987, 106, 182422 b); (R)(-)-carvone isolated from leaf essential oil (*Flavour Fragrance J.* 1987, 2, 95; *Chem. Abstr.* 1988, 109, 20290 s).

M. sylvestris L.; see *M. longifolia* (L.) Huds.

M. viridis L.; see *M. spicata* L.

MENYANTHES (Gentianaceae)

M. trifoliata L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 423).

Distribution of coumarin, foliamenthin, loganin, dihydrofoliamenthin, menthiafoline, scopoletin and sweroside in different parts of plant studied (*Farm. Pol.* 1987, 42, 286; *Chem. Abstr.* 1987, 106, 211016 e).

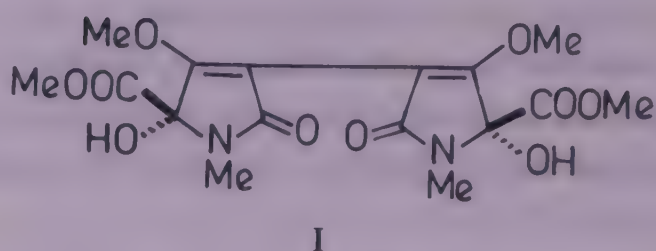
MERCURIALIS (Euphorbiaceae)

M. leiocarpa Sieb. & Zucc.

A new 2-oxo-3-pyrroline dimer - 3,3'-bis(1,1'-dimethyl-2,2'-dioxo-4,4'-dimethoxy-5,5'-dihydroxy-5,5'-dimethoxycarbonyl-3-pyrroline) (I) - isolated and its crystal structure determined (*Phytochemistry* 1986, 25, 1470); synthesis of 2-oxo-3-pyrroline dimer (I) (*Phytochemistry* 1989, 28, 960); citronellol, 2,3-dihydrobenzofuran, geraniol, 3-hexen-1-ol, myrtanal, myrtanol, myrtenal, myrtenol, phenyl acetaldehyde, β -phenethyl alcohol and phytol identified in essential oil by GC-MS (*Nippon Nogei Kagaku Kaishi* 1988, 62, 1217; *Chem. Abstr.* 1988, 109, 208305 e).

Distribution : Himalayas, from nepal to Arunachal Pradesh, alt. 2500-3000 m.

NEW COMPOUNDS

**MERIANDRA** (Lamiaceae)

M. benghalensis Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 423).

(+) Camphor present in essential oil as major component (*Essent. Oils Aromat. Plants, Proc. Int. Symp.* 15th, 1984, 151; *Chem. Abstr.* 1986, 104, 10346 x).

MERREMIA (Convolvulaceae)

M. dissecta (Jacq.) Hallier f. syn. *Ipomoea sinuata* Ortega (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 143).

Prunasin and 6'-O-malonylprunasin isolated from leaves (*Phytochemistry* 1989, 28, 623).

M. emerginata (Burm.f.) Hallier f.; see *M. gangetica* (L.) Cufo

M. gangetica (L.) Cufo syn. *Ipomoea reniformis* (Roxb.) Choisy, *Merremia emerginata* (Burm.f.) Hallier f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 142).

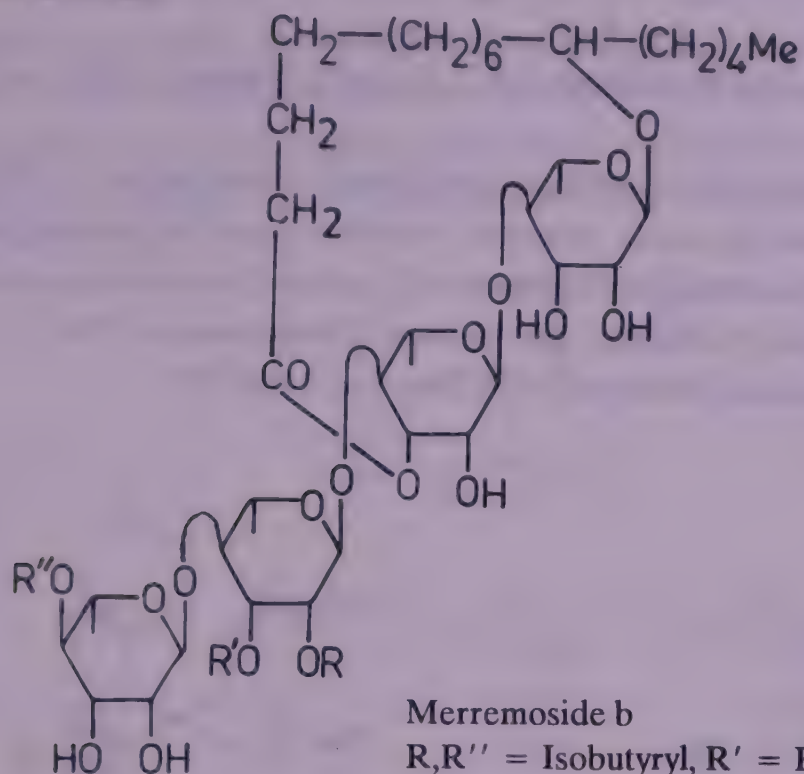
Caffeic, p-coumaric, ferulic and sinapic acid esters identified in seeds (*Himalayan Chem. Pharm. Bull.* 1985, 2, 12; *Chem. Abstr.* 1986, 104, 183306 n).

M. mammosa (Lour.) Hallier f. syn. *Ipomoea gomezii* Clarke

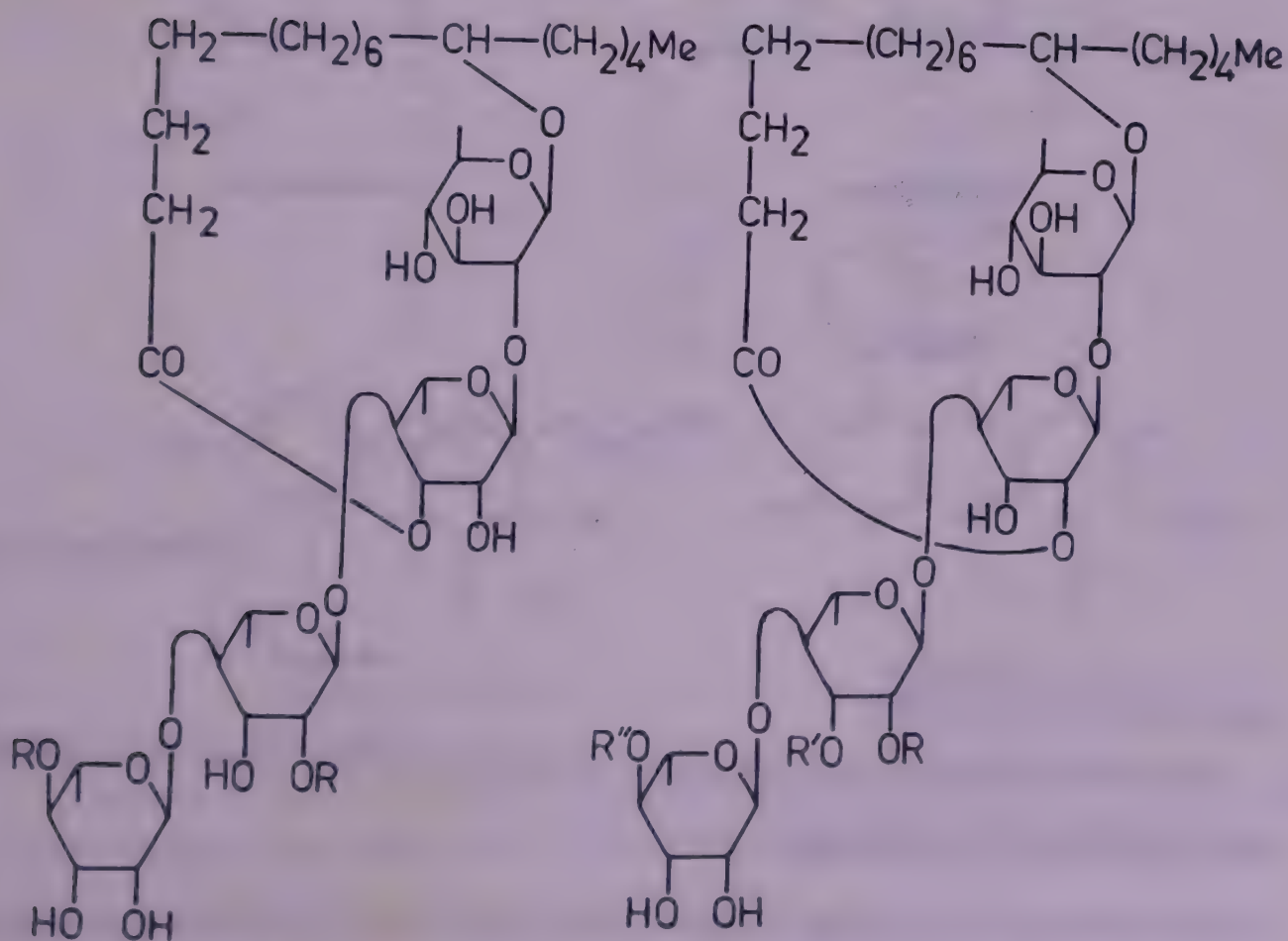
Six new resin glycosides - merremosides a, b, c, d, f and g - isolated from tubers of Indonesian plant and structures of merremosides b and d determined (*Chem. Pharm. Bull.* 1988, 36, 1681); jalapinolic acid, aglycone of merremosides, and its epimer synthesised (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1988, 30, 252; *Chem. Abstr.* 1989, 111, 12377 b); four new resin glycosides - mammosides A, B, H1 and H2 - isolated from tubers of Indonesian plant and structures of mammosides B and H1 elucidated (*Chem. Pharm. Bull.* 1989, 37, 1131).

Distribution : Lakhimpur (Assam) and Andaman Islands.

NEW COMPOUNDS



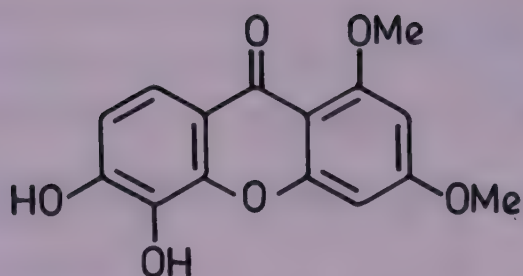
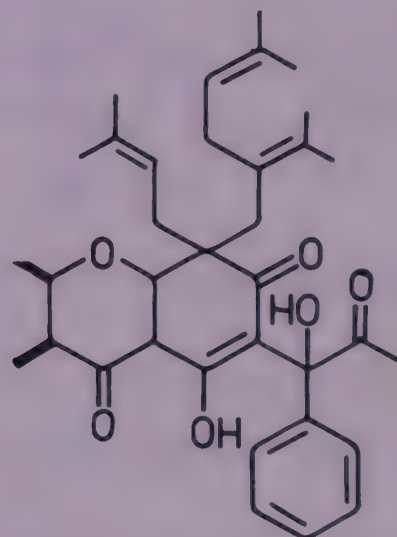
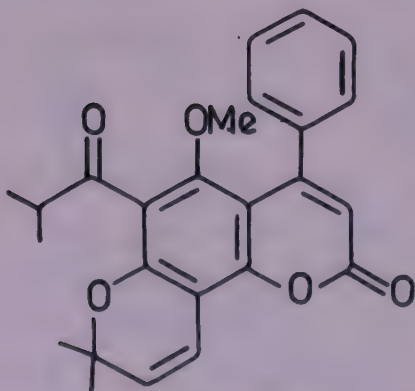
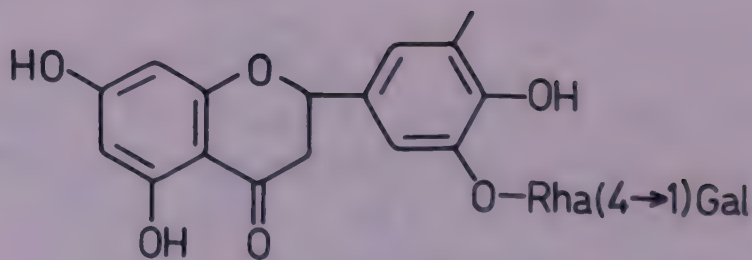
Merremoside d
 $R = \text{H}, R', R'' = \text{Isobutyryl}$



MESUA (Clusiaceae)

M. ferrea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 423).

Ferrxanthone isolated and its structure elucidated (*Phytochemistry* 1984, 23, 1816); isolation of a new flavanone glycoside - mesuein - from leaves and its characterisation (*Chem. Ind.* 1987, 565); a new cyclohexadione - mesuaferrol - isolated from stamens and its structure established; β -amyrin and β -sitosterol also isolated (*Phytochemistry* 1988, 27, 2325); new 4-phenylcoumarin - mesuarin - from seed oil (*Chem. Ind.* 1988, 239).

NEW COMPOUNDS**Ferrxanthone****Mesuaferrol****Mesuarin****Mesuein****BIOLOGICAL ACTIVITY**

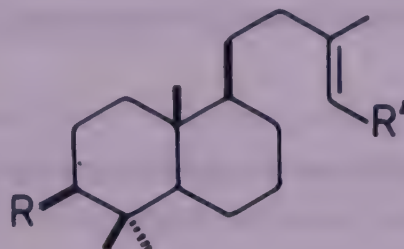
Mesuarin exhibited antibacterial activity against *Bacillus firmis* (*Chem. Ind.* 1988, 239).

METASEQUOIA (Taxodiaceae)

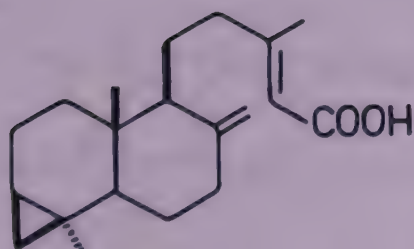
M. glyptostrobooides Hu & Cheng (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 457).

Twelve labdane diterpenes (I-XII) isolated and their structures determined (*Nippon Nogei Kagaku Kaishi* 1984, 58, 887; *Chem. Abstr.* 1985, 102, 21171 w); isolation of (+)catechin, (-)epicatechin and epigallocatechin from needles (*Am. J. Bot.* 1986, 73, 1555; *Chem. Abstr.* 1987, 106, 30031 k); two new antifungal diterpenes - metasequoic acids A and B - isolated and their structures elucidated (*Chem. Lett.* 1987, 123; *Chem. Abstr.* 1988, 108, 147149 n).

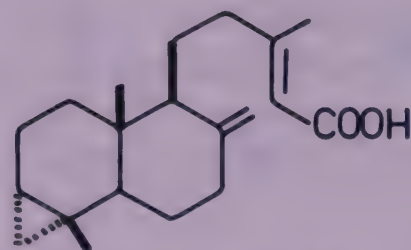
NEW COMPOUNDS



| Compound | R | R' |
|----------|-----|--------------------|
| I | OH | COOH |
| II | OH | COOMe |
| III | OH | CHO |
| IV | OH | CH ₂ OH |
| V | H | COOH |
| VI | H | COOMe |
| VII | H | CHO |
| VIII | H | CH ₂ OH |
| IX | OAc | COOH |
| X | OAc | COOMe |
| XI | OAc | CHO |
| XII | OAc | CH ₂ OH |



Metasequoic acid A



Metasequoic acid B

BIOLOGICAL ACTIVITY

Labdane diterpenes I, II and III strongly inhibited germination of *Pyricularia oryzae* spores (*Nippon Nogei Kagaku Kaishi* 1984, 58, 887; *Chem. Abstr.* 1985, 102, 21171 w).

MICHELIA (Magnoliaceae)

M. champaca L. (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 166).

Costunolide, parthenolide, dihydroparthenolide and micheliolide isolated from root bark (*Planta Med.* 1984, 50, 364).

M. montana (Glossary Indian Med. Plants, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 167).

Assam - Pan sopa.

Safrole isolated from leaves and sarisan from trunk bark (*Planta Med.* 1987, 53, 505).

Distribution : Hills of Assam and Arunachal Pradesh.

MICROGLOSSA (Asteraceae)

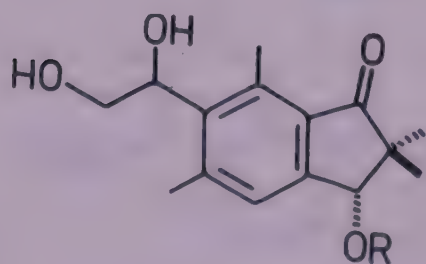
M. zeylanica (Arn.) Benth.; see *Psidia zeylanica* (Arn.) Grierson

MICROLEPIA (Dennstaedtiaceae)

M. polypodioides Bedd.; see *M. trapeziformis* (Roxb. ex Griff.) Kuhn

M. speluncae (L.) Moore (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 425).

Isolation and structure elucidation of spelosin (13-hydroxy-3(R)pterosin D) and its 3-O-arabinoside, 3(R)pterosin D-3-O- α -L-arabinopyranoside (I) and (2R,3R)pterosin L-3-O- α -L-arabinopyranoside (II) from fronds; pterosins I, H and Z, 3(R)pterosin D and (2R,3R) pterosin L also isolated (*Chem. Pharm. Bull.* 1985, 33, 2305).

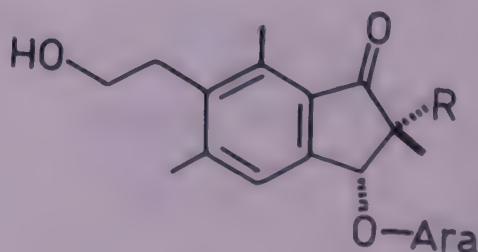
NEW COMPOUNDS

Spelosin

R = H

Spelosin-3-O-arabinoside

R = Ara



I

R = Me

II

R = CH₂OH

M. speluncae (L.) Moore var. *rhomboidea* Bedd.; see *M. trapeziformis* (Roxb. ex Griff.) Kuhn

***M. strigosa* (Thunb.) Presl**

2(R)Pterosin B, (2S,3S)pterosin C and its 3-O-glucoside, 3(R)pterosin D, 2(R)pterosin F, (2R,3R)pterosin L, 2(R)pterosin O and 2(S)pterosin P isolated from fronds (*Chem. Pharm. Bull.* 1985, 33, 2305).

Distribution : Hills of north and south India.

M. trapeziformis (Roxb. ex Griff.) Kuhn syn. *M. speluncae* (L.) Moore var. *rhomboidea* Bedd., *M. polypodiodes* Bedd.

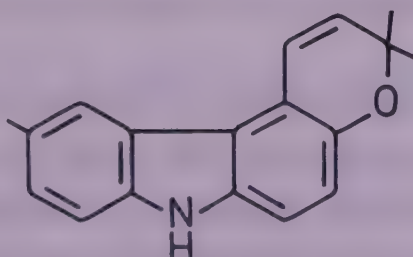
Isolation of (2R,3R)pterosin L-3-O- α -L-arabinoside, pterosin H, pterosin Z and spelosin-3-O- α -L-arabinoside from fronds (*Chem. Pharm. Bull.* 1985, 33, 2305).

Distribution : Tropical regions of India.

MICROMELUM (Rutaceae)***M. falcatum* (Lour.) Tanaka**

Isolation and structure elucidation of a new carbazole alkaloid - 5,6-pyranoglycozoline - from roots; yuehchukene, micromelin, phebalosin and mupanidin also isolated (*Biochem. Syst. Ecol.* 1988, 16, 485; *Chem. Abstr.* 1989, 110, 92079 y).

Distribution : Andaman Islands.

NEW COMPOUNDS

5,6-Pyranoglycozoline

M. integerrimum (Buch.-Ham. ex Colebr.) Wt. & Arn. ex M.Roem. syn. *M. pubescens* auct. (non Blume) (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 459).

Micromelin, phebalosin and yuehchukene isolated from roots (*Biochem. Syst. Ecol.* 1988, 16, 485; *Chem. Abstr.* 1989, 110, 92079 y).

M. pubescens Blume; see *M. integerrimum* (Buch.-Ham. ex Colebr.) Wt. & Arn. ex M.Roem.

MICROMERIA (Lamiaceae)

M. capitellata Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 167).

Determination of pulegone (80.0%) in oil (1.6%) by GC (*Parfuem. Kosmet.* 1988, 69, 163; *Chem. Abstr.* 1988, 109, 43302 m).

MICROSORIUM (Polypodiaceae)*M. fortunei* (Moore) Ching

Uracil (1.6), uridine (1.3%), 3-carboxyesculetin, fern-9(11)-ene, 24-methylenecycloartanone and 24-methylenecycloartanyl acetate found to be present in fronds (*Yakugaku Zasshi* 1985, 105, 655; *Chem. Abstr.* 1985, 103, 157319 d).

Distribution : Eastern Himalayas.

MICROULA (Boraginaceae)*M. sikkimensis* (Clarke) Hemsl. syn. *Anchusa sikkimensis* Clarke

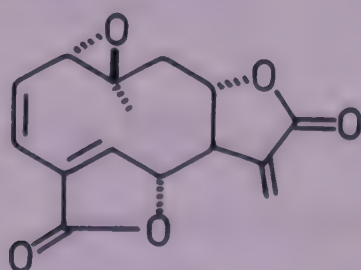
Cis-6,9,12-octadecatrienoic (8.1), cis-6,9,12,15-octadecatetraenoic (7.3), 11-eicosenoic (5.5), cis-13-docosenoic (1.6) and cis-15-tetracosenoic (1.2%) acids determined in seed oil (45.0%) (*Zhiwu Xuebao* 1989, 31, 50; *Chem. Abstr.* 1989, 111, 150590 s).

Distribution : Himalayas, Nepal eastwards, alt. 3300-3600 m.

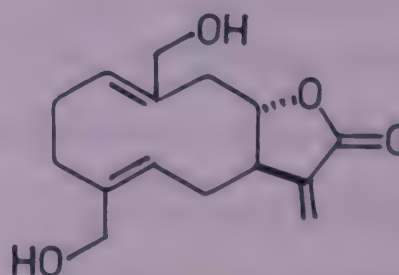
MIKANIA (Asteraceae)*M. cordata* (Burm.f.) R.L. Robinson; see *M. micrantha* Kunth

M. micrantha Kunth syn. *M. cordata* (Burm.f.) R.L. Robinson, *M. scandens* Hook.f. (non Willd.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 425).

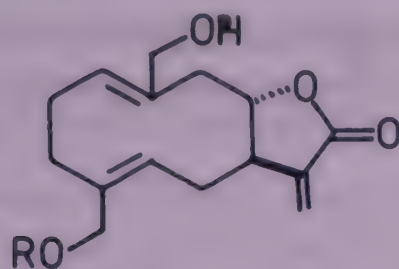
Isolation of β -sitosterol and stigmasterol from aerial parts and leaves (*Bangladesh J. Sci. Ind. Res.* 1986, 21, 272; *Chem. Abstr.* 1988, 109, 125808 v); five new germacranolides - micrantholide and its acyl derivatives (I, II, III and IV) - isolated from aerial parts and their structures elucidated; deoxymikanolide and miscandenin also isolated (*Planta Med.* 1987, 53, 105); isolation of a new dilactone - anhydroscandenolide - along with mikanolide, deoxymikanolide, dihydromikanolide, scandenolide and dihydroscandenolide and characterisation of new compound (*J. Nat. Prod.* 1988, 51, 625).

NEW COMPOUNDS

Anhydroscandenolide



Micrantholide



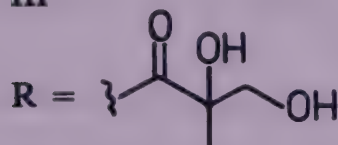
I

R = Isobutyryl

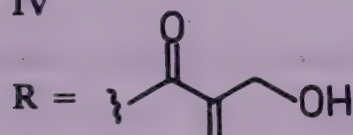
II

R = Methacryloyl

III



IV



M. scandens Willd.; see *M. micrantha* Kunth

MILLETTIA (Papilionaceae)

M. auriculata Baker ex Brand.; see *M. extensa* (Benth.) Baker

M. extensa (Benth.) Baker syn. *M. auriculata* Baker ex Brand. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 425).

Aurmillone isolated from seeds and characterised as 5,7-dihydroxy-8-methoxy-3[4-(3-methyl-2-butenoyloxy)phenyl]-4H-1-benzopyran-4-one; its crystal structure determined (*Acta Crystallogr., Cryst. Struct. Commun.* 1986, 42C, 597; *Chem. Abstr.* 1986, 105, 208635 e).

M. ovalifolia Kurz; see *M. peguensis* Ali

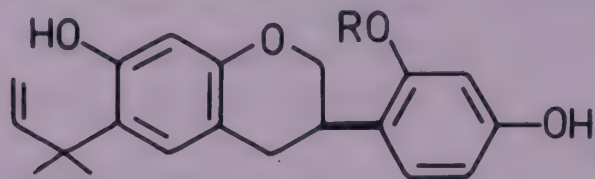
M. peguensis Ali syn. *M. ovalifolia* Kurz (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 427).

A new furanochalcone isolated from roots and characterised as 1-(4-hydroxy-5-benzofuranyl)-3-phenyl-2-propen-1-one (*Indian J. Chem.* 1987, 26B, 704).

M. racemosa Benth. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 463).

Three new isoflavans - (+)3(R)millinol, (+)3(R)millinol B and (+)3(R)cyclomillinol - isolated from stems without bark and their structures determined (*Phytochemistry* 1989, 28, 913).

NEW COMPOUNDS

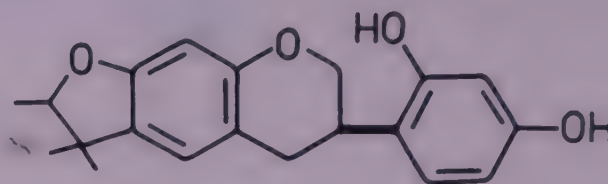


(+)3(R)Millinol

R = H

(+)3(R)Millinol B

R = Me



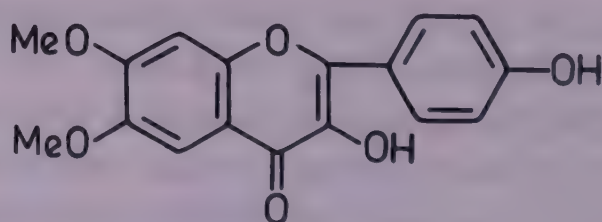
(+)3(R)Cyclomillinol

MILLINGTONIA (Bignoniaceae)

M. hortensis L.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 429).

β -Carotene, dinatin and its 7-rutinoside isolated from leaves (*Indian Drugs* 1984, 21, 420); isolation of hispidulin from flowers (*J. Sci. Soc. Thailand* 1987, 13, 71; *Chem. Abstr.* 1988, 108, 87857 e); hortensin isolated from flowers and its structure established (*Phytochemistry* 1989, 28, 1555).

NEW COMPOUNDS



Hortensin

BIOLOGICAL ACTIVITY

Hispidulin showed bronchodilating effect on isolated rat trachea; it was more potent than aminophylline and less toxic than crude extract (*J. Sci. Soc. Thailand* 1987, 13, 71; *Chem. Abstr.* 1988, 108, 87857 e).

MIMOSA (Mimosaceae)

M. hamata Willd.

Bo. - Aukur; Tel. - Undra; Tam. - Indiri.

4-Ethylgallic acid isolated from flowers (*Phytochemistry* 1988, 27, 3004).

Distribution : Punjab, central and south India in plains.

M. himalayana Gamble; see *M. rubicaulis* Lamk. ssp. *himalayana* (Gamble) Ohashi

M. rubicaulis Lamk.; see *M. rubicaulis* Lamk. ssp. *himalayana* (Gamble) Ohashi

M. rubicaulis Lamk. ssp. *himalayana* (Gamble) Ohashi syn. *M. rubicaulis* sensu Baker (non Lamk.) p.p., *M. himalayana* Gamble (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 167).

Flowers afforded 4-ethylgallic acid (*Phytochemistry* 1988, 27, 3004).

MIMUSOPS (Sapotaceae)

M. elengi L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 464).

A new steroidal saponin isolated from roots and characterised as 5 α -stigmast-9(11)ene-3-O- β -D-glucopyranosyl(1 \rightarrow 5)-O- β -D-xylopyranoside (*Fitoterapia* 1988, 59, 418).

MIRABILIS (Nyctaginaceae)

M. jalapa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 429).

Isolation of 8-hydroxyoctadeca-cis-11,14-dienoic acid from seed oil (*Phytochemistry* 1984, 23, 2247); β -sitosterol, its glucoside, β -amyrin and its 3-O- α -L-rhamnosyl-glucopyranoside isolated from seeds (*Natl. Acad. Sci. Lett.* 1986, 9, 135); stigmasterol and β -sitosterol identified in roots by GC-MS (*Acta Pharm. Jugosl.* 1988, 38, 255; *Chem. Abstr.* 1989, 111, 130725 m); a linear D-glucan isolated from root bulb and partially characterised (*Carbohydr. Res.* 1988, 176, 327; *Chem. Abstr.* 1988, 109, 3868 u).

MITRAGYNA (Rubiaceae)

M. parvifolia (Roxb.) Korth. syn. *Stephegyne parvifolia* (Roxb.) Korth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 429).

Hirsutene synthesised (*J. Chem. Soc. Perkin 1* 1985, 2625; *J. Am. Chem. Soc.* 1985, 107, 4088; *Chem. Commun.* 1986, 1049; *Tetrahedron* 1988, 44, 3833).

MITREPHORA (Annonaceae)

M. heyneana Thw.

Betulinic acid, betulin, lupeol and β -sitosterol isolated from bark (*Int. J. Crude Drug Res.* 1985, 23, 73).

Distribution : Nilgiris, Palni Hills, Travancore and Tinnevely (Tirunelveli), alt. 600 m.

MOGHANIA (Papilionaceae)

M. macrophylla (Willd.) O.Ktze.; see *Flemingia macrophylla* (Willd.) O.Ktze. ex Merr.

MOLLUGO (Molluginaceae)

M. oppositifolia L.; see *Glinus oppositifolius* (L.) A.DC.

M. pentaphylla L. syn. *M. stricta* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 430).

An antifungal compound - mollugogenol A - isolated from aerial parts along with inactive mollugogenol B (*Phytochemistry* 1989, 28, 1767).

M. spergula L.; see *Glinus oppositifolius* (L.) A.DC.

M. stricta L.; see *M. pentaphylla* L.

MOMORDICA (Cucurbitaceae)

M. charantia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 430).

Two new proteins - α - and β -momorcharins - isolated from seeds of Chinese plant and partially characterised (*Adv. Chin. Med. Mater. Res., Int. Symp.* 1984, 311; *Chem. Abstr.* 1986, 104, 135932 s); paraffins (C12-C30), p-cymene, hexadecanol, (-)-menthol, nerolidol, penta-decanol and squalene identified in seed oil (*Nihon Daigaku Kogakubu Kiyo, Bunrui A* 1985, 26, 165; *Chem. Abstr.* 1985, 103, 200685 j); oil from football-shaped seeds contained 10 α -cucurbita-5,24-dien-3 β -ol as major component whereas that from slender-shaped seeds contained 24-methylenecycloartanol; cycloartenol, taraxerol and β -amyrin present in both oils (*Agric. Biol. Chem.* 1986, 50, 2921); campesterol, cycloeucalenol, 24 β -ethyl-5 α -cholesta-7-trans-22-dien-3 β -ol, 24 β -ethyl-5 α -cholesta-7-trans-22,25(27)-trien-3 β -ol, lophenol, 4 α -methylzymosterol, obtusifoliol, spinasterol, stigmasterol, stigmasta-7,25-dienol and stigmasta-7,22,25-trienol identified in seed oil (*Nihon Daigaku Kogakubu Kiyo, Bunrui A* 1986, 27, 99; *Chem. Abstr.* 1986, 105, 57906 r); a mixture of two acylglycosylsterols - 3-O-[6'-O-palmitoyl- β -D-glucosyl]stigmasta-5,25(27)-diene (major) and 3-O-[6'-O-stearyl- β -D-glucosyl]stigmasta-5,25(27)-diene - isolated from fruits (*Phytochemistry* 1989, 28, 1721); benzyl alcohol, myrtenol, cis-3-hexenol, trans-2-hexenal, 1-penten-3-ol and cis-2-penten-1-ol identified in fruits and vines by GC (*J. Agric. Food Chem.* 1989, 37, 418; *Chem. Abstr.* 1989, 110, 132192 p).

BIOLOGICAL ACTIVITY

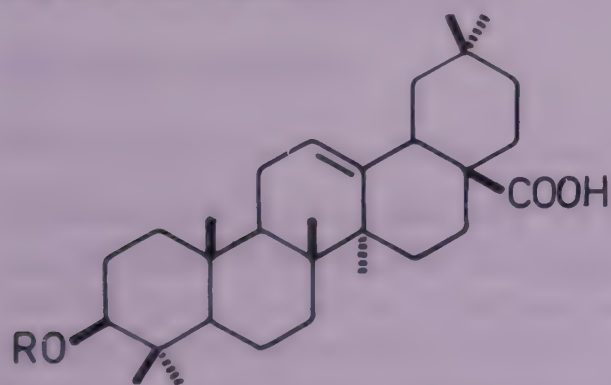
α -Momorcharin and β -momorcharin induced midterm abortion in mouse (*Adv. Chin. Med. Mater. Res., Int. Symp.* 1984, 311; *Chem. Abstr.* 1986, 104, 135932 s).

M. cochinchinensis (Lour.) Spreng. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 279).

A sterol glycoside fraction from tubers showed haemolytic activity (*J. Ethnopharmacol.* 1986, 18, 55; *Chem. Abstr.* 1987, 106, 96123 y).

Columbin isolated from roots of Bangladesh plant collected in June (*Planta Med.* 1985, 51, 181); three new momordins I, II and III isolated from roots and characterised as oleanolic acid 3-O- α -L-arabinopyranosyl(1 \rightarrow 3)- β -D-glucuronopyranoside, its 28-O- β -glucopyranoside and 3 β -hydroxy-11 α ,12 α -epoxyolean-28,13-olide-3-O- α -L-arabinopyranosyl(1 \rightarrow 3)- β -D-glucuronopyranoside respectively (*Chem. Pharm. Bull.* 1985, 33, 1; *Phytochemistry* 1988, 27, 3585); isolation of two momordica saponins I and II from seeds and their characterisation as 3-O- β -D-galactopyranosyl(1 \rightarrow 2)-[α -L-rhamnopyranosyl(1 \rightarrow 3)]- β -D-glucuronopyranosido-28-O- β -xylopyranosyl(1 \rightarrow 3)- β -D-glucopyranosyl(1 \rightarrow 3)-[β -D-xylopyranosyl(1 \rightarrow 4)]- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-fucopyranosides of gypsogenin and quillaic acid respectively (*Chem. Pharm. Bull.* 1985, 33, 464); oleanolic acid glucoside and oleanolic acid arabinoglucoside isolated from tubers (*J. Bangladesh Acad. Sci.* 1986, 10, 25; *Chem. Abstr.* 1986, 105, 75994 x); chondrillasterol isolated from tubers (*Planta Med.* 1987, 53, 578); ten new saponins - momordins Ia, Ib, Ic, Id, Ie, IIa, IIb, IIc, IId and IIe - isolated from roots and their structures determined (*Phytochemistry* 1988, 27, 3585).

NEW COMPOUNDS



Momordin I

R = Gluc.acid(3 \rightarrow 1)Ara

Momordin Ia

R = Gluc.acid methyl ester(3 \rightarrow 1)Ara

Momordin Ib

R = Gluc.acid

Momordin Ic

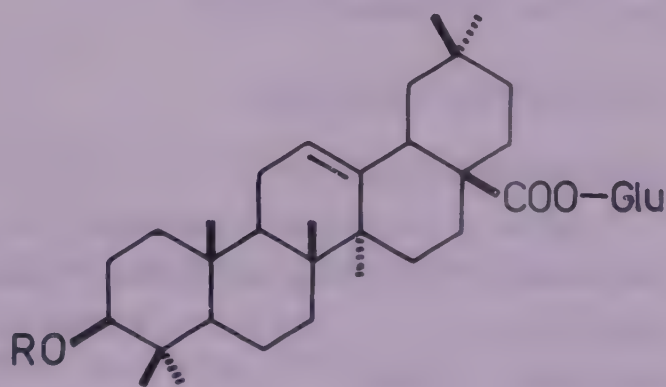
R = Gluc.acid(3 \rightarrow 1)Xyl

Momordin Id

R = Gluc.acid[(2 \rightarrow 1)Xyl](3 \rightarrow 1)Xyl

Momordin Ie

R = Gluc.acid[(2 \rightarrow 1)Xyl](3 \rightarrow 1)Ara



Momordin II

R = Gluc.acid(3 \rightarrow 1)Ara

Momordin IIa

R = Gluc.acid methyl ester (3 \rightarrow 1)Ara

Momordin IIb

R = Gluc.acid

Momordin IIc

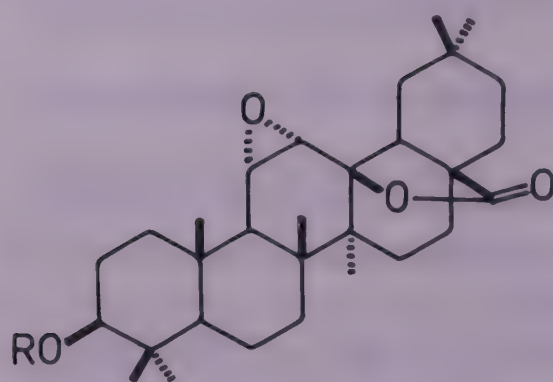
R = Gluc.acid(3 \rightarrow 1)Xyl

Momordin IId

R = Gluc.acid[(2 \rightarrow 1)Xyl](3 \rightarrow 1)Xyl

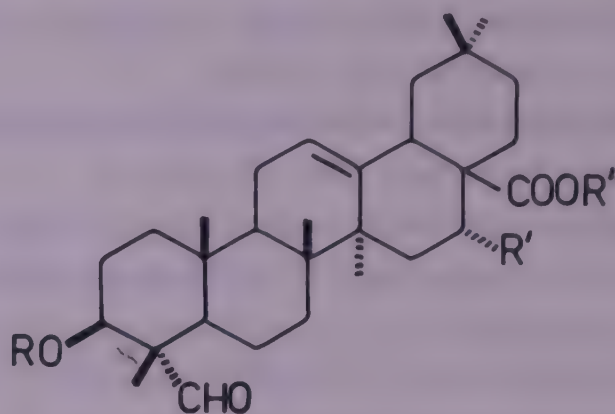
Momordin IIe

R = Gluc.acid[(2 \rightarrow 1)Xyl](3 \rightarrow 1)Ara



Momordin III

R = Gluc.acid(3→1)Ara



Momordica saponin I

R = Gluc.acid[(2→1)Gal](3→1)Rha, R' = H,
R'' = Fuc(2→1)Rha[(3→1)Glu(3→1)Xyl](4→1)Xyl

Momordica saponin II

R = Gluc.acid[(2→1)Gal](3→1)Rha, R' = OH,
R'' = Fuc(2→1)Rha[(3→1)Glu(3→1)Xyl](4→1)Xyl

BIOLOGICAL ACTIVITY

Oleanolic acid glucoside and oleanolic acid arabinoglucoside showed hypoglycaemic activity in streptozotocin-induced diabetic rats at a dose of 25.0 mg/kg. I.p. administration showed better results than oral administration (*J. Bangladesh Acad. Sci.* 1986, 10, 25; *Chem. Abstr.* 1986, 105, 75994 x).

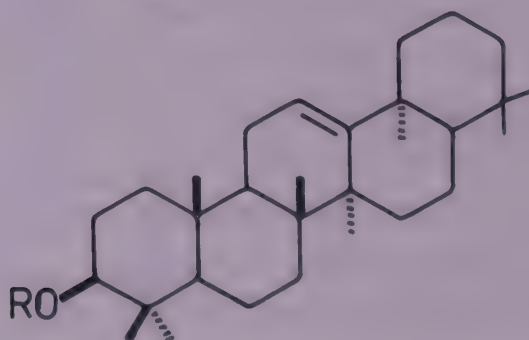
MONECHMA (Acanthaceae)

M. debile (Forsk.) Nees

Isolation of a triterpene - monechmol - and its 3-O-glucoside and their characterisation (*Planta Med.* 1984, 50, 520); lariciresinol 4'-monomethyl ether isolated (*Int. J. Crude Drug Res.* 1987, 25, 15).

Distribution : Gujarat.

NEW COMPOUNDS



Monechmol

R = H

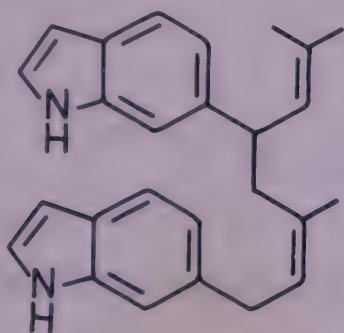
Monechmol-3-O-glucoside

R = Glu

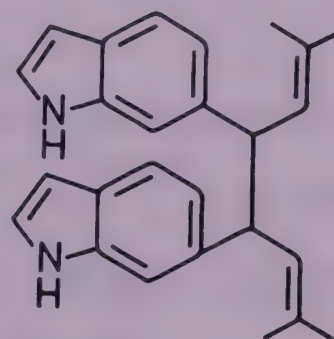
MONODORA (Annonaceae)***M. myristica* (Gaertn.) Dunal**

6-(3,3-Dimethylallyl)indole isolated from seeds (*Fitoterapia* 1986, 57, 58); isolation of two dimeric 6-(γ,γ -dimethylallyl)indoles - monodoroindeole and isomonodoroindeole - from seeds and their structure determination (*J. Bangladesh Acad. Sci.* 1987, 11, 1; *Chem. Abstr.* 1987, 107, 172452 t); p-cymene and linalool identified as major constituents in seed oil by GC-MS (*Fitoterapia* 1988, 59, 52).

Distribution : Native of tropical Africa and Madagascar. Planted in Indian Botanic Garden, Howrah.

NEW COMPOUNDS

Monodoroindeole



Isomonodoroindeole

MOONIA (Asteraceae)

M. heterophylla Arn. syn. *Chrysogonum amottianum* (Wt.) Clarke, *C. heterophyllum* (Arn.) Clarke

Anethole, its isobutyrate and 2-methylbutyrate, p-isobutyryloxy-(2-oxopropyl)benzene, p-isovaleryloxy-(2-oxopropyl)benzene and mixture of methyl butyl anethole and isovaleryl anethole isolated (*Pharmazie* 1988, 43, 372; *Chem. Abstr.* 1988, 109, 89799 g).

Distribution : The Nilgiris southwards, alt. 1800-2100 m.

MORINDA (Rubiaceae)

M. citrifolia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 433).

A new anthraquinone isolated from roots and characterised as 7-hydroxy-8-methoxy-2-methylantraquinone (*Curr. Sci.* 1989, 58, 249).

MORINGA (Moringaceae)

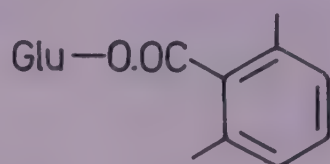
M. concanensis Nimmo (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 280).

Rutin (0.1), quercetin (0.02%) and kaempferol-3-rutinoside identified in flowers (*Indian Drugs* 1985, 22, 279).

M. oleifera Lamk. syn. *M. pterygosperma* Gaertn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 434).

A new glycoside - moringyne - isolated from seeds and its structure elucidated (*Pakistan J. Sci. Ind. Res.* 1985, 28, 7; *Chem. Abstr.* 1985, 103, 51180 m).

NEW COMPOUNDS



Moringyne

M. pterygosperma Gaertn.; see *M. oleifera* Lamk. *

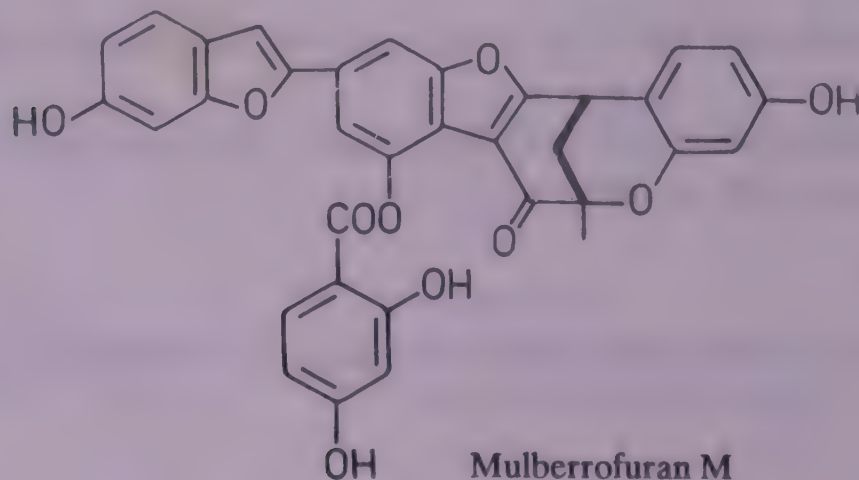
MORUS (Moraceae)

M. alba L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 434).

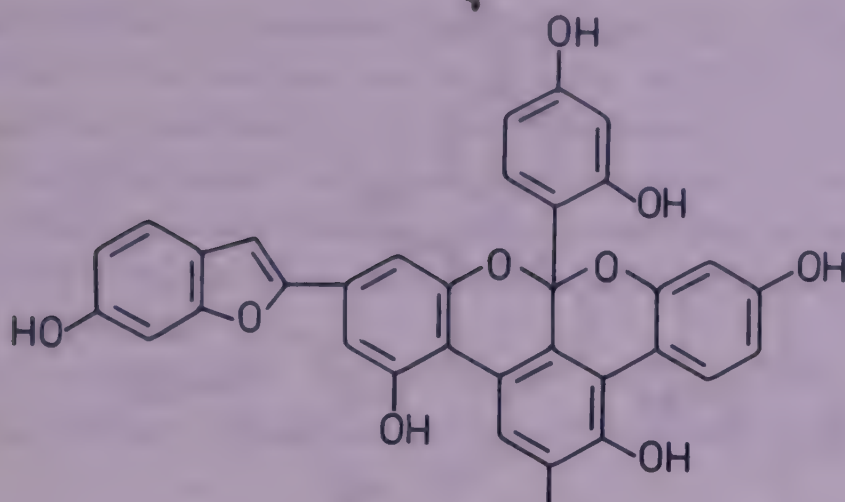
An aqueous-methanolic extract of root bark greatly reduced plasma sugar level in mice (*Planta Med.* 1985, 51, 156).

A glycoprotein - moran A - isolated from root bark (*Planta Med.* 1985, 51, 156); three new 2,3-arylbenzofurans - mulberrofurans M, P and Q - isolated from root bark and their structures elucidated; Kuwanol B also isolated (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 710; *Chem. Abstr.* 1985, 104, 145484 m; *Heterocycles* 1986, 24, 1381, 1807); isolation and characterisation of Diels-Alder type adducts - kuwanons , Q, R and V - from callus tissue of cultivated plant (*Chem. Pharm. Bull.* 1986, 34, 2471); two new stilbene derivatives - kuwanon Y and kuwanon Z - isolated from root bark of cultivated plant and their structures established (*Heterocycles* 1986, 24, 2603).

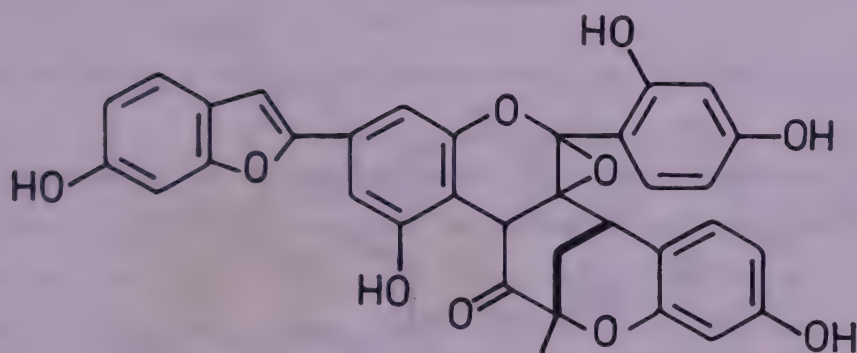
NEW COMPOUNDS



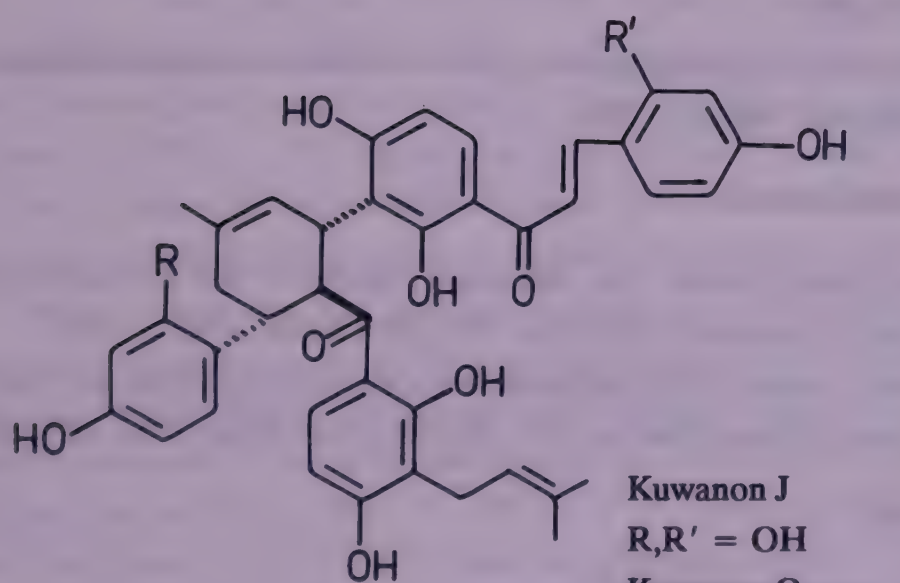
Mulberrofuran M



Mulberrofuran P



Mulberrofuran Q



Kuwanon J

R,R' = OH

Kuwanon Q

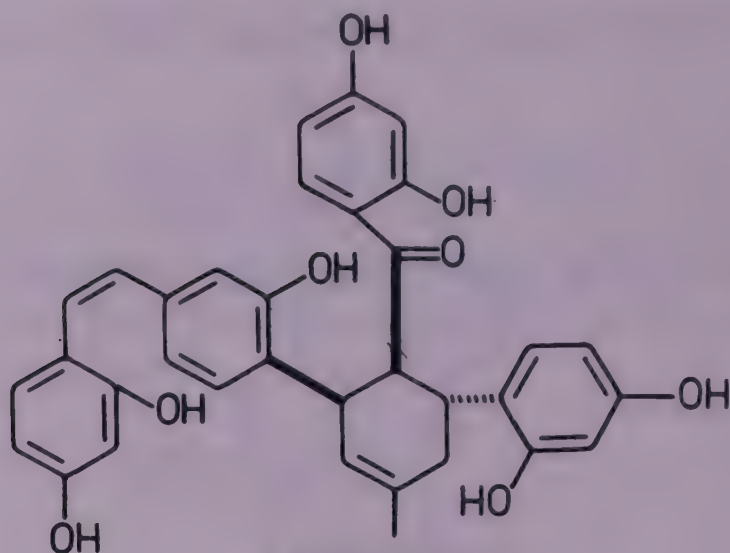
R = H, R' = OH

Kuwanon R

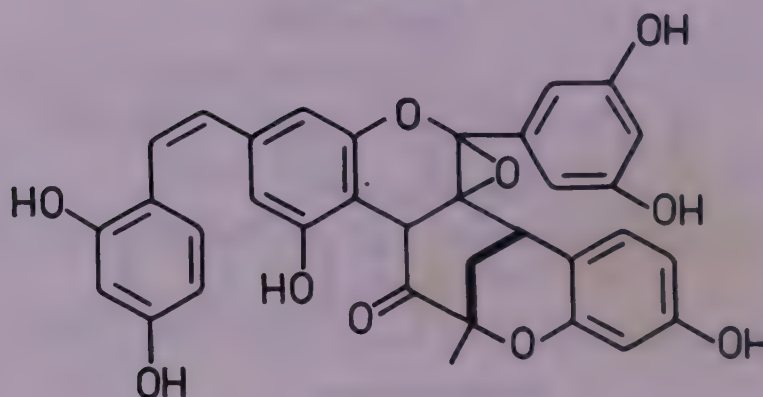
R = OH, R' = H

Kuwanon V

R,R' = H



Kuwanon Y



Kuwanon Z

BIOLOGICAL ACTIVITY

Moran A exhibited marked hypoglycaemic effect in normal and alloxan-induced hyperglycaemic mice (*Planta Med.* 1985, 51, 156).

MURDANNIA (Commelinaceae)

M. triquetra (Wall. ex Clarke) Bruckn. syn. *Aneilema triquetrum* Wall. ex Clarke (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 439).

Polypodine B isolated along with β -ecdysone and α -deoxy- β -ecdysone and characterised as 5 β -hydroxy- β -ecdysone (*Zhiwu Xuebao* 1984, 26, 554; *Chem. Abstr.* 1985, 102, 92953 p).

MURRAYA (Rutaceae)

M. exotica L.; see *M. paniculata* (L.) Jack

M. koenigii (L.) Spreng. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 439).

Root extract was devoid of anti-implantation activity in rats even at sublethal dose of 2.3 g equiv./ml; girinimbine found to be present (*Int. J. Crude Drug Res.* 1986, 24, 167).

Stem bark afforded 3-(1,1-dimethylallyl)xanthyletin (*J. Indian Chem. Soc.* 1984, 61, 650); koenoline isolated from root bark and its structure elucidated as 1-methoxy-3-hydroxy-methylcarbazole and confirmed by synthesis (*Phytochemistry* 1985, 24, 3041); isolation of 2-methoxy-3-methylcarbazole from seeds and its structure elucidation (*Indian J. Chem.* 1985, 24B, 452); another carbazole alkaloid - 2-hydroxy-3-methylcarbazole - isolated from roots (*Chem. Ind.* 1986, 246); isolation of mahanine from leaves and its ¹³C-NMR studied (*Fitoterapia* 1988, 59, 494).

BIOLOGICAL ACTIVITY

Koenoline exhibited cytotoxic activity against KB cell culture (*Phytochemistry* 1985, 24, 3041).

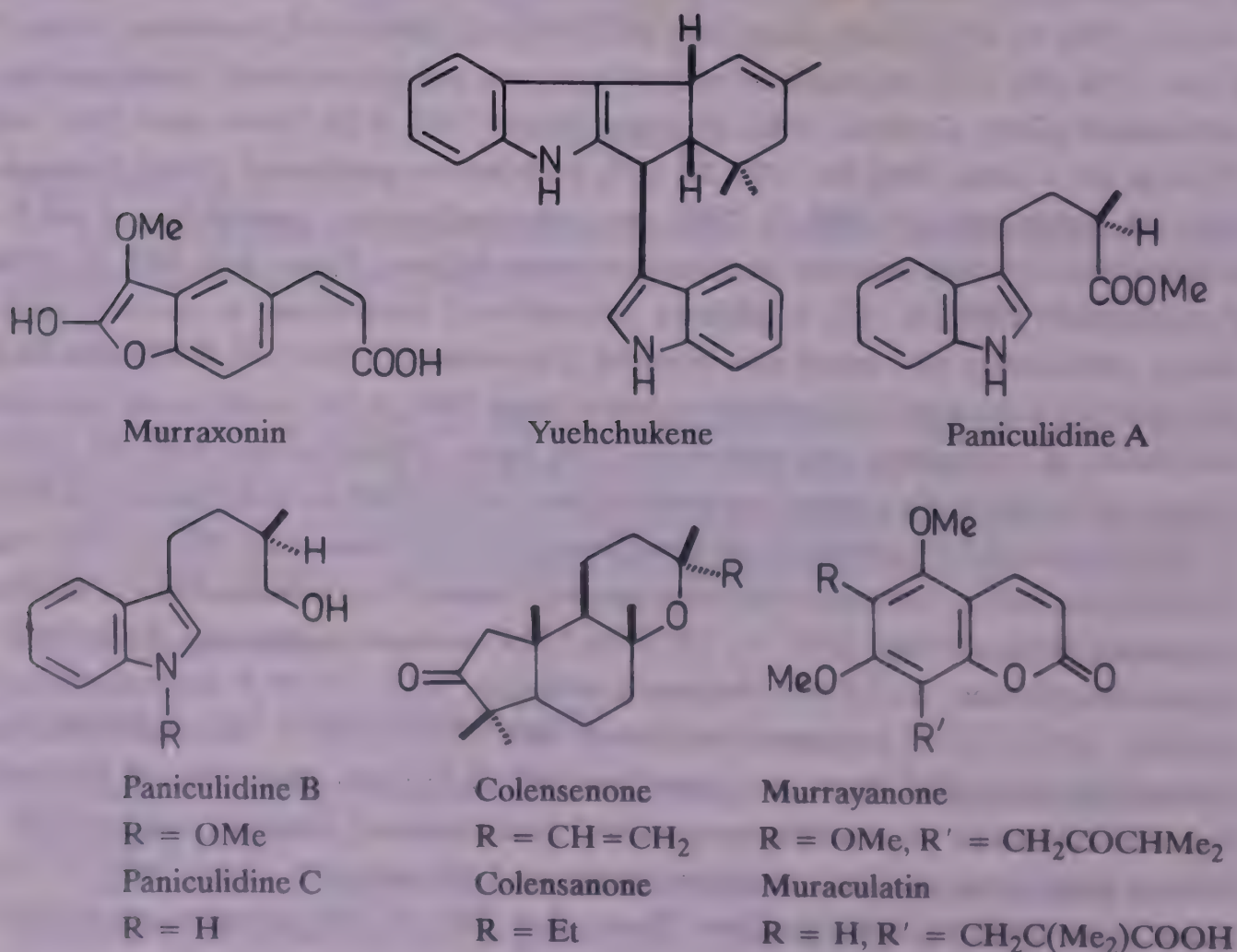
M. paniculata (L.) Jack syn. *M. exotica* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 440).

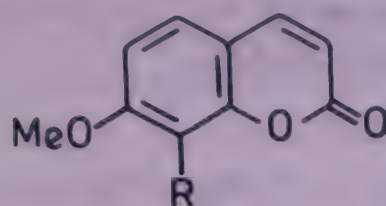
Root extract showed anti-implantation activity in rats (*Int. J. Crude Drug Res.* 1986, 24, 167).

A new coumarin isolated from leaves and branches and characterised as 7-methoxy-8(1'-acetoxy-2'-oxo-3'-methylbutyl)coumarin; murpanicin, isomerazin, 7-methoxy-8-(2'-methyl-2'-formylpropyl)coumarin and 5,7,3',4',5'-pentamethoxyflavone also isolated (*Huaxue Xuebao* 1984, 42, 1308; *Chem. Abstr.* 1985, 102, 128816 n); synthesis of girinimbine (*Indian J. Chem.* 1984, 23B, 849); yuehchukene isolated from roots and characterised; crystal structure determined (*Chem. Commun.* 1985, 47; *Jiegou Huaxue* 1985, 4, 30; *Chem. Abstr.* 1986, 104, 31728 p; *Int. J. Crude Drug Res.* 1986, 24, 167); yuehchukene synthesised (*Chem. Commun.* 1985, 48; *Tetrahedron Lett.* 1988, 29, 2993); two new prenyl indoles - paniculidines A and B - isolated from root bark and their structures determined (*Chem. Pharm. Bull.* 1985, 33, 1770; *Phytochemistry* 1989, 28, 147); in addition, paniculidine C isolated and its structure established; murralongin and osthol also obtained (*Phytochemistry* 1989, 28, 147); stem bark afforded 3-(1,1-dimethylallyl)xanthyletin (*Indian Drugs* 1986, 24, 64); isolation and structure elucidation of murraxonin and murraxocin from leaves (*Phytochemistry* 1987, 26, 3319); isolation of aurantiamide acetate from stem bark and its ¹³C-NMR studied (*Planta Med.* 1987, 53, 393); sitosterol- β -D-galactoside obtained from stem bark (*Planta Med.* 1987, 53, 579); two nonditerpene oxides - colensenone and colensanone - isolated from leaves and their structures established (*Indian Drugs* 1987, 24, 322); 5,6,7,3',4'-pentamethoxyflavone, 3,5,7,3',4',5'-hexamethoxyflavone, 5,6,7,3',4',5'-hexamethoxyflavone, 3,5,6,7,3',4',5'-heptamethoxyflavone, 3,4,7,8,3',4',5'-heptamethoxyflavone and 3,5,6,7,8,3',4',5'-octamethoxyflavone isolated from leaves (*Bull. Pharm. Sci., Assiut Univ.* 1987, 10, 55; *Chem. Abstr.* 1989, 110, 92047 m); four new coumarins - coumurrin, murpaniculol (murranganon), paniculal and paniculin - isolated from leaves and their structures determined (*Shoyakugaku Zasshi* 1987, 41, 157; *Chem. Abstr.* 1988, 108, 52809 p; *Chem. Pharm. Bull.* 1989, 37, 358); isolation and structure

elucidation of peroxyauraptenol, cis-dehydroosthol, murraol, murranganon, murrangatin acetate, isomurranganon senecioate, isomurralonginol acetate and chloticol from leaves (*Chem. Pharm. Bull.* 1987, 35, 4277); three new coumarins - isomurralonginol nicotinate, panial and cis-osthenon - isolated from leaves and their structures determined (*Heterocycles* 1987, 26, 2959); synthesis of murraol (*Ann. Chem.* 1988, 543); isolation of murrayanone and muraculatin from leaves and their structures elucidation (*Phytochemistry* 1988, 27, 2357); a mixture of C15-C18 fatty acid esters of murrangatin isolated from root bark of Indonesian plant and characterised; 5,7-dimethoxy-8-(3'-methyl-2'-oxo-butyl)coumarin, caffeic acid ester, edulitine, 5,7,3',4',5'-pentamethoxyflavone, 5,7,8,3',4',5'-hexamethoxyflavone, methyl N-methylanthranilate, mexotycin, murrangatin, murralongin and sibiricin also isolated (*Chem. Pharm. Bull.* 1989, 37, 119); leaves afforded auraptenol, exoticin, heinanmurpanin, 7-methoxy-8-(2'-formyl-2'-methylpropyl)coumarin, 7-methoxy-8-formylcoumarin, meranzin hydrate, isomeranzin, murrayatin, murralongin, murrangatin and its acetate and 5,7,8,3',4',5'-hexamethoxyflavone (*Chem. Pharm. Bull.* 1989, 37, 358); isolation of new coumarins - peroxy-murraol and paniculonol isovalerate - from leaves and their structure determination (*Chem. Pharm. Bull.* 1989, 37, 819).

NEW COMPOUNDS





| Compound | R |
|--------------------------|--|
| Chloticol | $\text{CH}_2\text{CH}(\text{OH})\text{C}(\text{Cl})\text{Me}_2$ |
| Coumurrin | $\text{CH}_2\text{CH}(\text{OCHO})\text{C}(\text{OH})\text{Me}_2$ |
| Cis-dehydroosthol | $\text{CH}=\text{CHC}(\text{Me})=\text{CH}_2$ |
| Isomurranganon | $\text{COCH}(\text{CHMe}_2)\text{O}.\text{OCCH}=\text{CMe}_2$ |
| Isomurralonginol acetate | $\text{CH}(\text{CH}_2\text{OAc})\text{C}(\text{Me})=\text{CH}_2$ |
| Murranganon | $\text{CH}(\text{OH})\text{COCHMe}_2$ |
| Murrangatin acetate | $\text{CH}(\text{OH})\text{CH}(\text{OAc})\text{C}(\text{Me})=\text{CH}_2$ |
| Murraol | $\text{CH}=\text{CHC}(\text{OH})\text{Me}_2$ |
| Murraxocin | $\text{CH}(\text{OEt})\text{CH}(\text{OH})\text{C}(\text{Me})=\text{CH}_2$ |
| Cis-osthenon | $\text{CH}=\text{CHCOMe}$ |
| Panial | $\text{CH}(\text{OH})\text{CH}=\text{C}(\text{Me})\text{CHO}$ |
| Paniculal | CHO |
| Paniculin | $\text{CH}_2\text{C}(\text{Me}_2)\text{COOH}$ |
| Paniculonol isovalerate | $\text{CH}_2\text{COC}(\text{Me}_2)\text{O}.\text{OCCH}_2\text{CMe}_2$ |
| Peroxyauraptenol | $\text{CH}_2\text{C}(\text{OOH})\text{C}(\text{Me})=\text{CH}_2$ |
| Peroxymurraol | $\text{CH}=\text{CHC}(\text{OOH})\text{Me}_2$ |

BIOLOGICAL ACTIVITY

Yuehchukene showed potent anti-implantation activity in rats (*Chem. Commun.* 1985, 47); it was active at 2.5 mg/kg, p.o. when given to female rats on day 1-2 of pregnancy (*Chem. Commun.* 1985, 48).

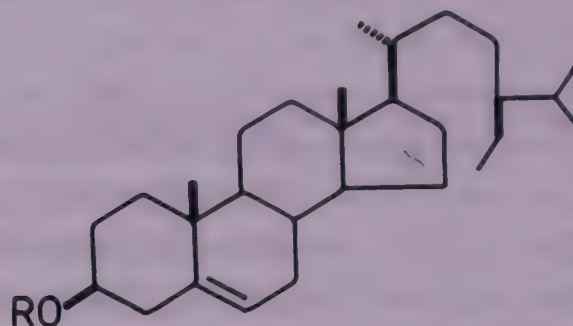
MUSA (Musaceae)

M. paradisiaca L. syn. *M. sapientum* L., *M. paradisiaca* L. var. *sapientum* (L.) Kuntze (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 441).

Dopamine, dopa, noradrenalin, serotonin and caffeic, cinnamic, p-coumaric, ferulic, gallic and protocatechuic acids, campesterol, β -sitosterol, stigmasterol, cyclomusalenol and cyclomusalenone isolated from flowers (*Kuo Li Chung-Kuo I Yao Yen Chiu So Yen Chiu Pao Kao* 1985, 115; *Chem. Abstr.* 1987, 106, 135269 x); isolation and characterisation of two acylsteryl glycosides - sitoindoside III and sitoindoside IV - and sitosterol-3-O-gentiobioside and sitosterol-3-O-myoinosityl(1 \rightarrow 6)- β -D-glucoside (*Phytochemistry* 1985, 24, 1807); a new sterol isolated and characterised as 24(S)14 α ,24-dimethyl-9 β ,19-cyclo-5 α -cholest-25-en-3 β -

ol; 4,4-dimethyl-, 4 α -methyl-, 4-desmethyl- and 3-oxo-4 α -methylsterols also isolated (*Lipids* 1986, 21, 494; *Chem. Abstr.* 1986, 105, 206256 k).

NEW COMPOUNDS



Sitoindoside III

R = Glu(6→1)Glu(6-palmitoyl)

Sitoindoside IV

R = Glu(6→1)myoinosityl(2-palmitoyl)

M. paradisiaca L. var. *sapientum* (L.) Kuntze; see *M. paradisiaca* L.

M. sapientum L.; see *M. paradisiaca* L.

MUSSAENDA (Rubiaceae)

M. frondosa L.

H. - Bedina, Bebina; B. - Nagballi; Kan. - Billoothi, Pathri, Hasthygida; Mal. - Parathole, Vellila; Mar. - Bhutkes, Bhurtkasi, Lavasat; Tam. - Vellaiyilai, Vellimadandai.

Ferulic acid, hyperin, quercetin, rutin, sinapic acid and β -sitosterol glucoside isolated from sepals (*Indian J. Pharm. Sci.* 1985, 47, 122).

Distribution : Himalayas, from Garhwal eastwards, Khasia Hills, alt. 300-1200 m, Deccan Peninsula and Andaman Islands, also grown in gardens.

M. frondosa L. var. *hirsutissima* Hook.f.; see *M. hirsutissima* (Hook.f.) Hutch. ex Gamble

M. hirsutissima (Hook.f.) Hutch. ex Gamble syn. *M. frondosa* L. var. *hirsutissima* Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 442).

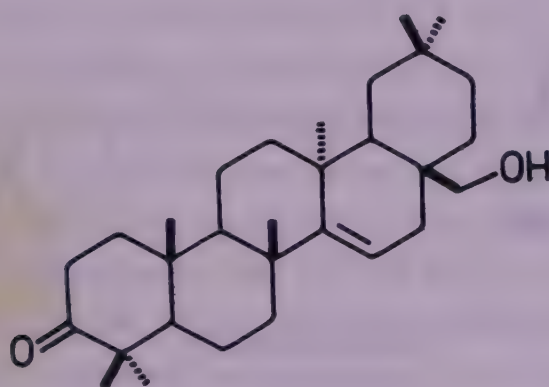
Ferulic acid, hyperin, quercetin, rutin, sinapic acid and β -sitosterol glucoside isolated from sepals (*Indian J. Pharm. Sci.* 1985, 47, 122).

MYRICA (Myricaceae)

M. esculenta Buch.-Ham. syn. *M. nagi* Hook.f. (non Thunb.), *M. rubra* Sieb. et Zucc. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 442).

A new triterpene isolated from bark and characterised as 28-hydroxy-D-friedoolean-14-en-2-one (I); myricadiol, sitosterol, taraxerone and taraxerol also isolated (*Phytochemistry* 1987, 26, 217); tannin isolated from bark identified as partially 3-O-gallated prodelphinidin (*Linchan Huaxue Yu Gongye* 1987, 7, 20; *Chem. Abstr.* 1988, 109, 3767 k); isolation of epigallocatechin-3-O-gallate, epigallocatechin(4 β →8)-epigallocatechin-3-O-gallate, 3-O-galloylepigallocatechin(4 β →8)-epigallocatechin-3-O-gallate, gallic acid, myricanol and myricanone from bark (*Phytochemistry* 1988, 27, 579); two new diarylheptanoid glycosides isolated from stem bark and characterised as myricanol-5-O- β -D-(6'-O-galloyl)glucopyranoside and myricanol-5-O- β -D-glucopyranosyl(1→6)- β -D-glucopyranoside; alphitolic, arjunolic, maslinic and oleanolic acids, acetyl oleanolic acid and myricolal also isolated (*Chem. Pharm. Bull.* 1988, 36, 1419).

NEW COMPOUNDS



I

M. nagi Thunb.; see *M. esculenta* Buch.-Ham.

M. rubra Sieb. et Zucc.; see *M. esculenta* Buch.-Ham.

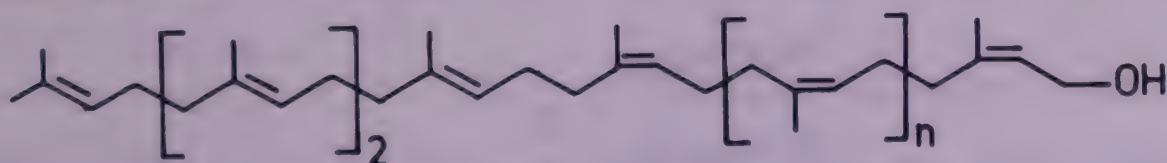
MYRIOPHYLLUM (Haloragaceae)

M. verticillatum L.

Three new polyprenols (I, II and III) isolated and their structures determined; hydroxylycopersene and isohydroxylycopersene also isolated (*Phytochemistry* 1988, 27, 887); prephytoene alcohol obtained from Italian plant (*Phytochemistry* 1988, 27, 2355).

Distribution : Kashmir, alt. above 2100 m.

NEW COMPOUNDS



I n = 5

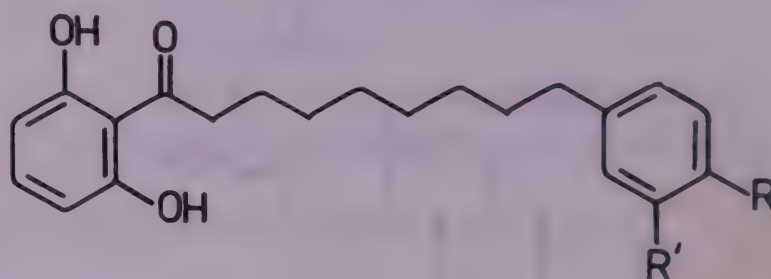
II n = 6

III n = 7

MYRISTICA (Myristicaceae)

M. dactyloides Gaertn. syn. *M. laurifolia* Hook.f. & Thoms., *M. laurifolia* Hook.f. & Thoms. var. *lanceolata* Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 443).

Isolation and structure determination of new arylalkanones - 1-(2,6-dihydroxyphenyl)-9-(4-hydroxy-3-methoxyphenyl)nonan-1-one (I), 1-(2,6-dihydroxyphenyl)tetradecan-1-one (II) and malabaricones A, B, C and D - from seeds (*Phytochemistry* 1987, 26, 3369); four new arylalkanones isolated from stem bark and characterised as 1-(2-methoxy-6-hydroxyphenyl)tetradecan-1-one, 1-(2-methoxy-6-hydroxyphenyl)-9-(3',4'-methylenedioxyphenyl)nonan-1-one, 1-(2,6-dihydroxyphenyl)tetradecan-1-one and 1-(2-methoxy-6-hydroxyphenyl)-9-(4-hydroxyphenyl)nonan-1-one (*Phytochemistry* 1988, 27, 465).

NEW COMPOUNDS

Malabaricone A

$R, R' = H$

Malabaricone B

$R = OH, R' = H$

Malabaricone C

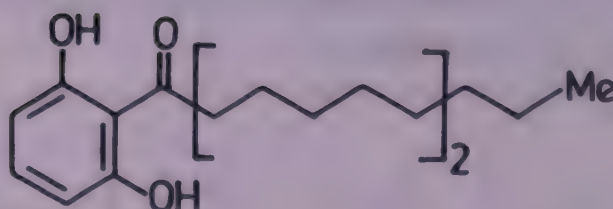
$R, R' = OH$

Malabaricone D

$R, R' = -OCH_2O-$

I

$R = OH, R' = OMe$



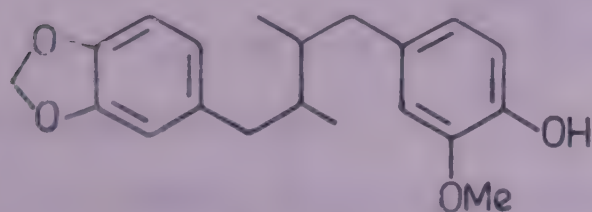
II

M. fragrans Houtt. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 443).

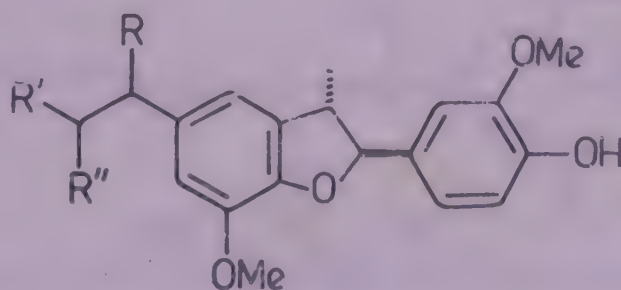
Aril extract showed antibacterial activity³ against *Streptococcus mutans* (*Chem. Pharm. Bull.* 1985, 34, 3885); mace (aril of fruit) used in Indonesian medicine as aromatic, stomachic, analgesic and for rheumatism. Its extract (1.5 g/kg) inhibited carrageenin-induced rat paw oedema and inhibited increase of dye leakage induced by acetic acid. It reduced the number of writhings induced by acetic acid (*Jap. J. Pharmacol.* 1989, 49, 155).

Camphene, eugenol, isoeugenol, elemicin, limonene, myristicin, α - and β -pinenes, safrole, α -terpineol and terpine-4-ol obtained from oil (*Planta Med.* 1984, 50, 222); dehydrodiisoeugenol, 5'-methoxydehydrodiisoeugenol, guaiacin and threo-2-(4-allyl-2,6-dimethoxyphenoxy)-1-(4-hydroxy-3-methoxyphenyl)propan-1-ol methyl ether isolated from mace (*Chem. Pharm. Bull.* 1985, 34, 3885); macelignan isolated from arils and its crystal structure determined as (2R,3S)-1-(3,4-methylenedioxyphenyl)-2,3-dimethyl-4-(4-hydroxy-3-methoxyphenyl)butane (*Phytochemistry* 1987, 26, 1542); new neolignans isolated from aril and characterised as erythro-1-(3',4',5'-trimethoxyphenyl)-2-(4''-allyl-2'',6''-dimethoxyphenoxy)propan-1,3-diol (I); threo-1-(4'-hydroxy-3'-methoxyphenyl)-2-(4''-allyl-2''-methoxyphenoxy)propan-1-ol (II), threo-1-(4'-hydroxy-3'-methoxyphenyl)-2-[2''-methoxy-4''-(1''')(E)propenyl]phenoxy]propan-1-ol (III), its erythro isomer, threo-1-(4'-hydroxy-3'-methoxyphenyl)-1-methoxy-2-[2''-methoxy-4''-(1''')(E)propenyl]phenoxy]propane (IV) and its erythro isomer; fragransols A and B, fragransins D1, D2, D3 and E1 also isolated along with austrobailignan-7 (*Phytochemistry* 1988, 27, 563); isolation and structure determination of four new neolignans - fragransol C, fragransol D, myristicanol A and myristicanol B - from aril; 3-(3,4,5-trimethoxyphenyl)-2(E)-propen-1-ol, 3-(3-methoxy-4,5-methylenedioxyphenyl)-2(E)-propen-1-ol, 3-(3-methoxy-4,5-methylenedioxyphenyl)-2(E)-propen-1-ol, 2,3-dihydro-7-methoxy-2-(3,4-dimethoxyphenyl)-3-methyl-5-[1(E) propenyl]benzofuran and 2,3 dimethyl-1,4-bis-(3,4-methylenedioxyphenyl)butan-1-ol also isolated (*Chem. Pharm. Bull.* 1988, 36, 648).

NEW COMPOUNDS



Macelignan

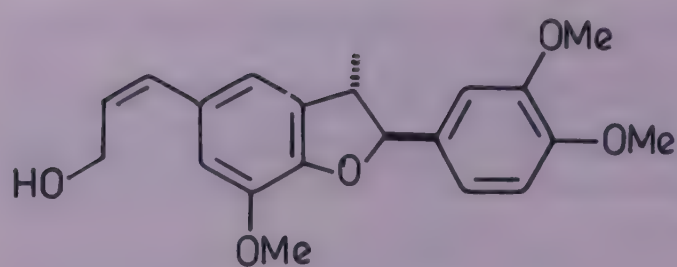


Fragransol A

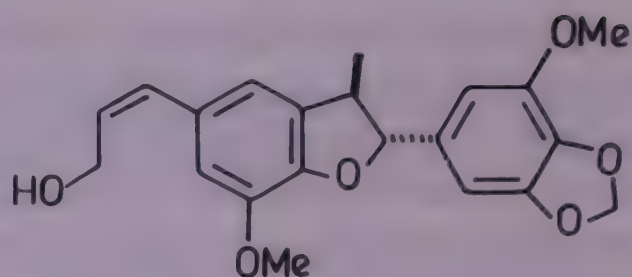
R = OMe, R' = OH, R'' = Me

Fragransol B

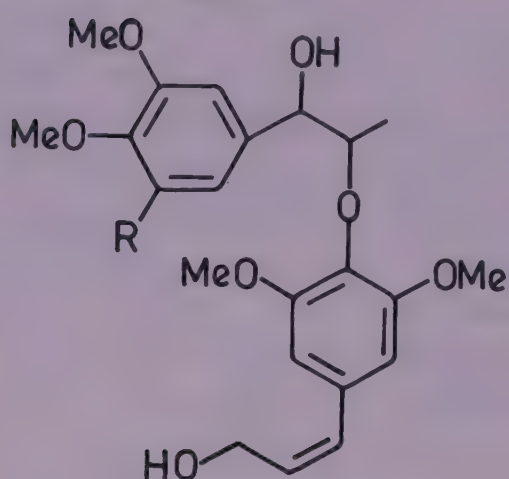
R, R' = H, R'' = OH



Fragransol C



Fragransol D

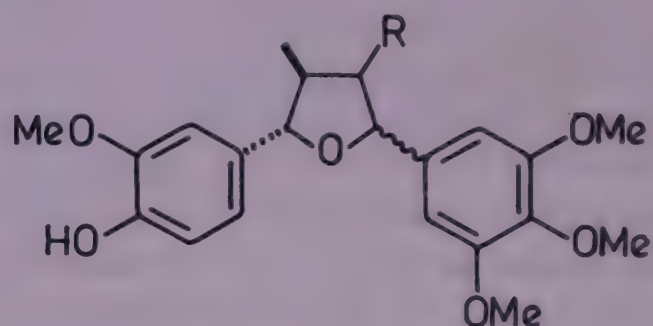


Myristicanol A

R = OMe

Myristicanol B

R = H



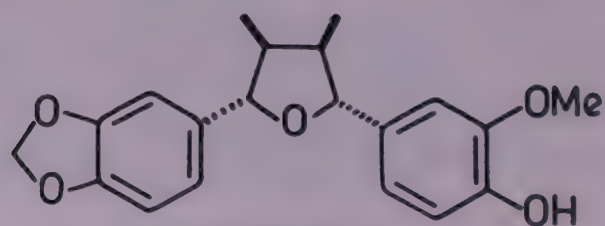
Fragransin D1

R = β -Me, \sim = α

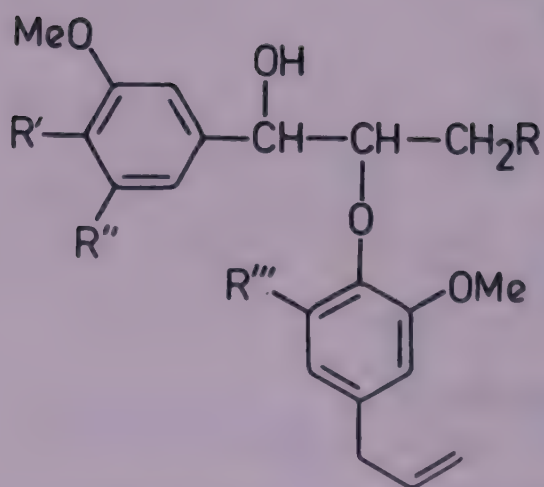
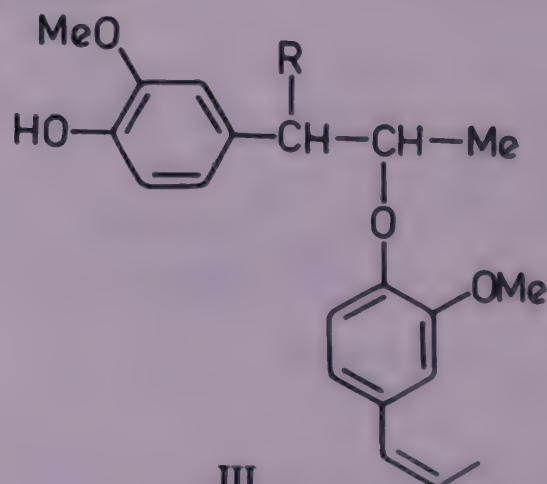
Fragransin D2

R = α -Me, \sim = β

Fragransin D3

R = α -Me, \sim = α 

Fragransin E1

I
R = OH, R', R'', R''' = OMeII
R, R'', R''' = H, R' = OHIII
R = OH
IV
R = OMe

BIOLOGICAL ACTIVITY

Eugenol and isoeugenol showed similar antiaggregating activity on rabbit platelets aggregated with arachidonic acid. Other active products in decreasing order of potency were safrole, myristicin, elemicin, limonene, α -terpineol and terpine-4-ol (*Planta Med.* 1984, 50, 222); dehydrodi isoeugenol and 5'-methoxydehydrodi isoeugenol at 12.5 μ g/ml concentration completely inhibited the growth of *Streptococcus mutans* (*Chem. Pharm. Bull.* 1985, 34, 3885); myristicin (170.0 mg/kg) inhibited increase of dye leakage induced by acetic acid in rats; inhibitory potency was same as that of 10.0 mg/kg of indomethacin (*Jap. J. Pharmacol.* 1989, 49, 155).

M. laurifolia Hook.f. & Thoms.; see *M. dactyloides* Gaertn.

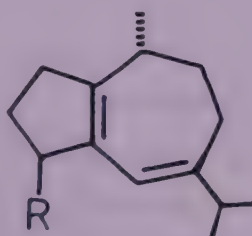
M. laurifolia Hook.f. & Thoms. var. *lanceolata* Hook.f.; see *M. dactyloides* Gaertn.

MYROXYLON (Papilionaceae)

M. balsamum (L.) Harms var. *balsamum* (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 477).

Isolation and structure determination of 1(5),6-guaiadiene and epi-1(5),6-guaiadiene (*Helv. Chim. Acta* 1987, 70, 1616).

NEW COMPOUNDS



1(5),6-Guaiadiene

R = α -Me

Epi-1(5),6-guaiadiene

R = β -Me

MYRSINE (Myrsinaceae)

M. africana L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 284).

Isolation of 2-hydroxychrysophanol from roots along with emodin, nepodin and 5-methoxy-7-hydroxyphthalide (*J. Nat. Prod.* 1989, 52, 660).

BIOLOGICAL ACTIVITY

2-Hydroxychrysophanol and emodin showed cytotoxic activity (*J. Nat. Prod.* 1989, 52, 660).

MYRTYS (Myrtaceae)

M. communis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 444).

Leaf extract (1.0-10.0 mg/ml) showed negative inotropic effect in isolated guinea pig atrium in concentration-dependent manner. It (1.0-30.0 mg/ml) showed concentration-dependent depressive effect on anaesthetised rabbit blood pressure which was not attenuated with propranolol (0.01 mM), cimetidine (0.1 mM) and atropine (0.1 mM) but was antagonised by theophylline (0.1 mM). It was active against both Gram-positive and Gram-negative bacteria and also suppressed growth of *Candida liopolica*, *C. pseudotropicalis* and *Saccharomyces cerevisiae* (*Indian J. Pharmacol.* 1985, 17, 233); i.v. administration of extracts of flowers and leaves produced hypotensive response in anaesthetised rats and reduced both tension and contraction of spontaneous movement of guinea pig atrium and contraction of ileum (*J. Biol. Sci. Res.* 1988, 19, 29); oral administration of extracts of leaves (0.5 g/kg) and flowers (1.0 g/kg) produced hyperglycaemia in rat (*J. Biol. Sci. Res.* 1988, 19, 41).

Myricetin-3-galactoside, myricetin-rhamnoside, quercetin-3-galactoside and -3-glucoside isolated from leaves (*Pharmazie* 1987, 42, 142; *Chem. Abstr.* 1987, 107, 46144 f); seeds afforded ellagic acid, gallic acid, patuletin and quercetin (*Plant. Med. Phytother.* 1987, 21, 317; *Chem. Abstr.* 1988, 109, 208328 q); myricetin, kaempferol, ellagic acid and gallic acid isolated from leaves and flowers (*J. Biol. Sci. Res.* 1988, 19, 29); isolation of esculin, esculetin, caffeic acid, kaempferol, myricetin, its 3'-glucoside, 3-rhamnoglucoside and 3,3'-digalactoside from leaves (*Plant. Med. Phytother.* 1988, 22, 98; *Chem. Abstr.* 1989, 110, 132155 d).

BIOLOGICAL ACTIVITY

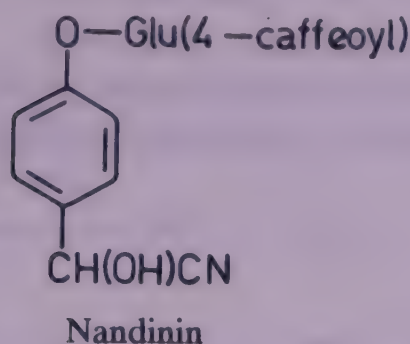
Tannins, myricetin glycosides and derivatives of gallic and ellagic acids showed antimicrobial activity against both Gram-positive and Gram-negative bacteria (*J. Biol. Sci. Res.* 1988, 19, 41).

NANDINA (Nandinaceae)

N. domestica Thunb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 444).

A new acylated cyanohydrin - nandinin - isolated from leaves and its structure determined (*Phytochemistry* 1984, 23, 1784).

NEW COMPOUNDS



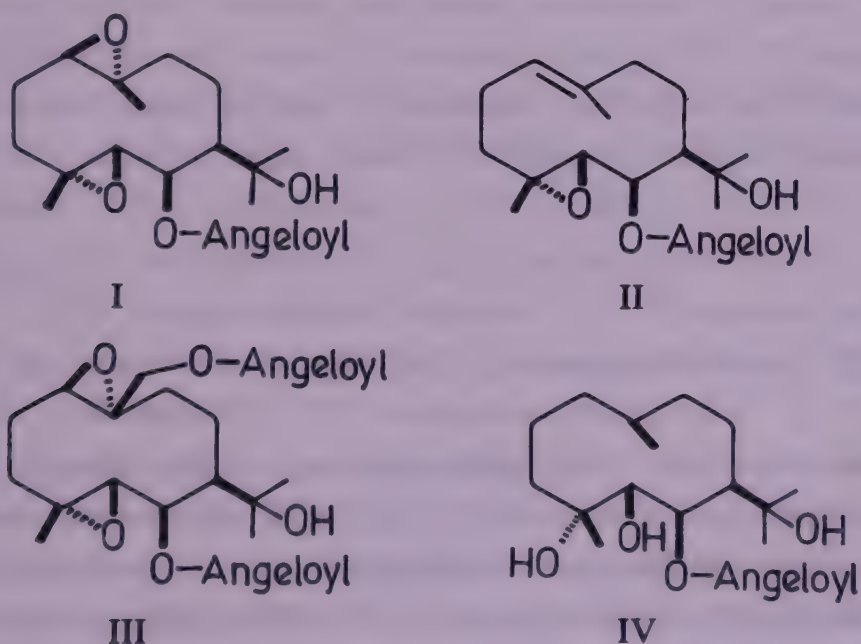
NANOTHAMNUS (Asteraceae)

N. sericeus Thoms.

Four new germacrane derivatives isolated and their structures determined by X-ray studies as (1R,4R,5R,6R,10R)-1,10:4,5-diepoxy-11-hydroxygermacran-6-yl(Z)2-methylbut-2-enoate (I), (4R,5R,6R)-4,5-epoxy-11-hydroxygermacr-1(10)-en-6-yl(Z)2-methylbut-2-enoate (II), (1R,4R,5R,6R,10S)-1,10:4,5-diepoxy-11-hydroxygermacran-6,14-diylbis[(Z)2-methylbut-2-enoate] (III) and 4ξ,5ξ,11-trihydroxygermacran-6-yl(Z)2-methylbut-2-enoate (IV) (*J. Chem. Soc. Perkin 1* 1988, 657).

Distribution : Konkan Hills in Maharashtra.

NEW COMPOUNDS



NARDOSTACHYS (Valerianaceae)

N. grandiflora DC.; see *N. jatamansi* (D.Don) DC.

N. jatamansi (D.Don) DC. syn. *N. grandiflora* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 445).

Tuber extract caused significant reduction of total cholesterol/phospholipids ratio and elevated ratio of HDL-cholesterol/total cholesterol in male rats (*Indian J. Physiol. Pharmacol.* 1988, 32, 299).

NARINGI (Rutaceae)

N. alata (Wall. ex Wt. & Arn.) Ellis syn. *Limonia alata* Wall. ex Wt. & Arn., *Pleiospermium alatum* (Wall. ex Wt. & Arn.) Swingle (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 480).

Aurapten, lupeol, seselin, suberenol, umbelliferone, xanthyletin and xanthoxyletin isolated from stem bark (*J. Nat. Prod.* 1985, 48, 501; *Planta Med.* 1988, 54, 91); seselin also isolated from fruits (*J. Nat. Prod.* 1985, 48, 501); isolation of two acridone alkaloids - 1,6-dihydroxy-2,3,5-trimethoxy-10-methyl-9-acridone and 1,5-dihydroxy-2,3-dimethoxy-10-methyl-9-acridone - from stem (*Phytochemistry* 1986, 25, 429).

N. crenulata (Roxb.) Nicolson syn. *Limonia crenulata* Roxb., *L. acidissima* auct. (non L.), *Hesperethusa crenulata* (Roxb.) M.Roem. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 445).

Limonin, luvangetin, marmesin, xanthotoxin, sitosterol and its glucoside isolated from leaves and stems; 2D-NMR studies of limonin (*J. Indian Chem. Soc.* 1988, 65, 205); antifungal agents psoralen from stem bark, xanthotoxin and osthénol from root bark and 2,6-dimethoxybenzoquinone from fruit shell (*Planta Med.* 1988, 54, 374); determination of dodecanoic (0.1), 1,3-propanedioic (0.8), 1,5-pentanedioic (0.4), 1,6-hexanedioic (0.2), 1,9-nonanedioic (0.4), 1,10-decanedioic (0.2), 1,11-undecanedioic (0.5), 1,16-hexadecanedioic (1.0), 2-hydroxypropanoic (1.1), 2-hydroxy-2-methylpropanoic (7.2), 3-hydroxy-2-methylbutanoic (3.9), 10-hydroxydecanoic (1.3), 11-hydroxyundecanoic (0.5), 10-hydroxypentadecanoic (0.1), 16-hydroxyhexadecanoic (0.9), 2,3-dihydroxybutanoic (0.1), 9,16-dihydroxyhexadecanoic, 10,16-dihydroxyhexadecanoic (27.9), 9,18-dihydroxyoctadecanoic and 10,18-dihydroxyoctadecanoic (1.5), 10,20-dihydroxyeicosanoic (10.9), 6-hydroxytetradecane-1,14-dioic and 7-hydroxytetradecane-1,14-dioic (0.9), 7-hydroxyhexadecane-1,16-dioic (15.2), 4-hydroxybenzoic (0.3), phthalic (2.4), 3-methoxy-4-hydroxybenzoic (0.1), 4-hydroxycinnamic (1.0) and 3-hydroxycinnamic (1.0) acids, 4-hydroxybenzaldehyde (0.2) and 1,17-heptadecanediol (1.4%) in leaf cutin (*Phytochemistry* 1989, 28, 509).

NEISOSPERMA (Apocynaceae)

N. oppositifolium (Lamk.) Fosb. & Sach. syn. *Ochrosia borbonica* sensu Hook.f. (non J.F.Gmel.), *O. oppositifolia* (Lamk.) K.Schum. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 445).

Synthesis of ochroproposinine (*Heterocycles* 1986, 24, 1215).

NELUMBIUM (Nymphaeaceae)

N. nuciferum Gaertn.; see *Nelumbo nucifera* Gaertn.

N. speciosum Willd.; see *Nelumbo nucifera* Gaertn.

NELUMBO (Nymphaeaceae)

N. nucifera Gaertn. syn. *Nelumbium speciosum* Willd., *N. nuciferum* Gaertn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 446).

Haemostatic activity shown by plant extract attributed to quercetin which was identified in receptacle (*Chem. Pharm. Bull.* 1988, 36, 4585).

Seeds afforded isoliensinine, neferine, arnepavine and 4'-methyl-N-methylcoclaurine (*J. Nat. Prod.* 1986, 49, 548); asimilobine and lirinidine isolated from leaves (*J. Nat. Prod.* 1987, 50, 773).

BIOLOGICAL ACTIVITY

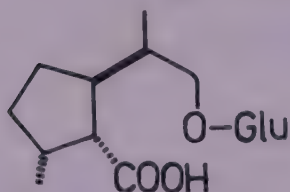
Neferine exhibited antihypertensive activity (*J. Nat. Prod.* 1986, 49, 548); asimilobine and lirinidine inhibited contraction of rabbit isolated aorta induced by serotonin (1.0 μ M) (*J. Nat. Prod.* 1987, 50, 773).

NEPETA (Lamiaceae)

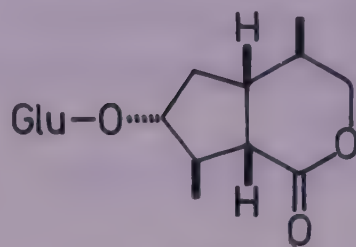
N. cataria L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 446).

A new iridoid glucoside - nepetariaside - isolated and its absolute structure determined by X-ray analysis (*Chem. Pharm. Bull.* 1987, 35, 2533); isolation of another iridoid glucoside - nepetaside - from aerial parts and its crystal structure determination; 1,5,9-epideoxyloganic acid also isolated (*Phytochemistry* 1988, 27, 469); (4aS,7S,7aR)nepetalactam and a mixed dimer of nepetalactam and nepetalic acid which was characterised as (4aS,7S,7aR)2-[(3R,4R,4aR,7S,7aR)octahydro-4,7-dimethyl-1-oxocyclopenta[c]pyran-3-yl]nepetalactam (I) isolated from oil; synthesis of mixed dimer (I) (*J. Org. Chem.* 1988, 53, 3968); isolation of four isomeric 7(S)nepetalactones from essential oil and their characterisation as 7(S)trans, trans-, 7(S)trans,cis-, 7(S)cis,cis- and 7(S)cis,trans-nepetalactones (*Flavour Fragrance J.* 1988, 3, 155; *Chem. Abstr.* 1989, 111, 191419 m).

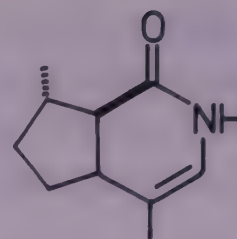
NEW COMPOUNDS



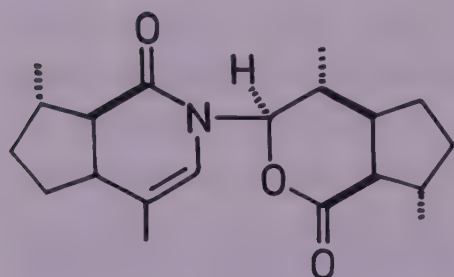
Nepetariaside



Nepetaside

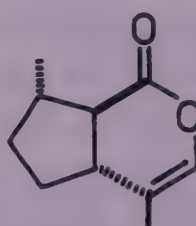


(4aS,7S,7aR)Nepetalactam

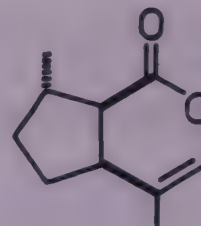


I I

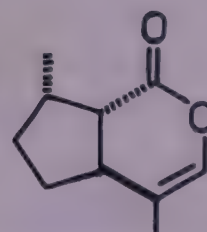
7(S)Trans,trans-nepetalactone



7(S)Trans,cis-nepetalactone



7(S)Cis,cis-nepetalactone

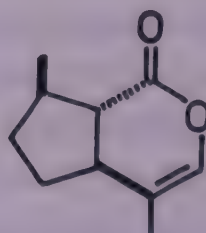


7(S)Cis,trans-nepetalactone

N. elliptica (Royle ex Benth.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 175).

7(R)Trans,trans-nepetalactone isolated as major component from essential oil of aerial parts and its structure determined (*Phytochemistry* 1987, 26, 1200).

NEW COMPOUNDS



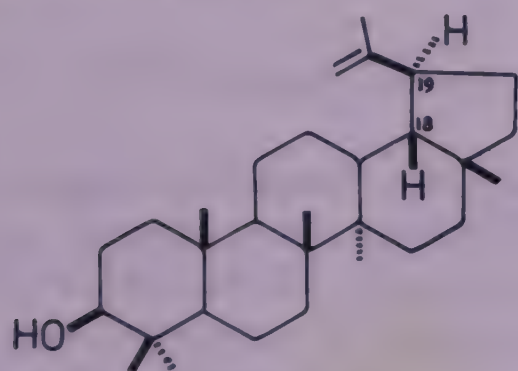
7(R)Trans,trans-nepetalactone

N. hindostana (Roth) Haines syn. *N. ruderalis* Buch.-Ham. ex Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 447).

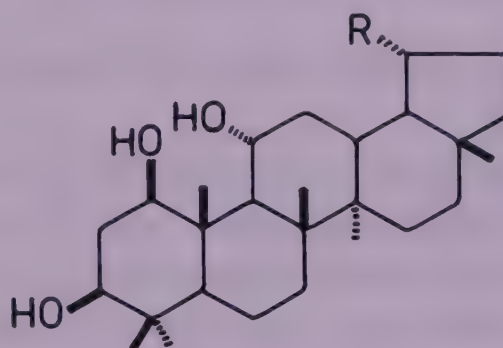
Lup-20(29)-ene-1 β ,3 β -diol isolated (*Fitoterapia* 1984, 55, 244); isolation of β -sitosterol glucoside and tetratriacontanol (*J. Chem. Soc. Pak.* 1985, 7, 339; *Chem. Abstr.* 1986, 104, 85417 e);

a new triterpene - nepehinol - isolated and characterised as 3β -hydroxy- 18β , 19α H-lup-20(19)-ene (*Planta Med.* 1985, 51, 521); 2α , 3β , 23 -trihydroxyurs-12-en-28-oic acid isolated and characterised (*Phytochemistry* 1986, 25, 1487); a new nortriterpenoid ketone - nepetidone - and a triterpenoid tetraol - nepedinol - isolated and their structures elucidated (*J. Nat. Prod.* 1986, 49, 524); ethyl esters of tridecanoic, heptadecanoic, octadecanoic and tricosanoic acids and both methyl and ethyl esters of hexadecanoic, docosanoic and eicosanoic acids isolated from wax; α - and β - amyrins, eicosane, heneicosane, hexacosane, hentriacontane, triacontane and dotriacontane isolated from plant (*Fitoterapia* 1988, 59, 77).

NEW COMPOUNDS



Nepehinol



Nepetidone

R = Ac

Nepedinol

R = C(=CH₂)CH₂OH

N. leucophylla Benth.

Ursolic acid isolated from leaves (*J. Indian Chem. Soc.* 1987, 64, 375).

Distribution : Himalayas, from Hiamachal Pradesh to Garhwal, alt. 1800-2600 m.

N. ruderalis Buch.-Ham. ex Benth.; see *N. hindostana* (Roth) Haines

NEPHROLEPIS (Nephrolepidaceae)

N. biserrata (Sw.) Schott

Isolation of (-)epicatechin-3-O- β -D-allopyranoside, (-)epicatechin-3-O- β -D-(2''-trans-cinnamoyl)allopyranoside and (-)epicatechin-3-O- β -D-(3''-trans-cinnamoyl)allopyranoside from fronds and their structure elucidation; sequoyitol also isolated (*Yakugaku Zasshi* 1985, 105, 649; *Chem. Abstr.* 1985, 103, 175379 c).

Distribution : North-east and south India.

N. cordifolia (L.) Presl syn. *N. tuberosa* Presl

Dustanin, fern-9(11)-ene, β -sitosterol and its glucoside isolated from leaves and stems (*J. Indian Chem. Soc.* 1988, 65, 881).

Distribution : Throughout India, ascending upto 1500 m in hills.

N. tuberosa Presl; see *N. cordifolia* (L.) Presl

NERIUM (Apocynaceae)

N. indicum Mill. syn. *N. odorum* Soland. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 484).

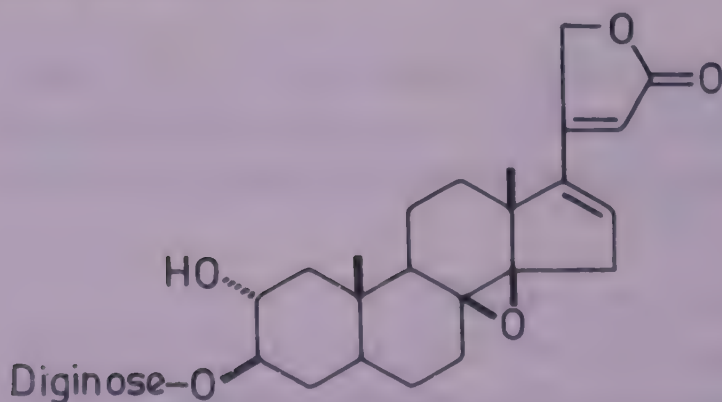
Neriumol and nerifol isolated from fresh leaves and identified as methyl 7,16-dihydroxyhexadeca-8(Z)-enoate and methyl 8,16-dihydroxyhexadecanoate respectively (*Planta Med.* 1987, 53, 47).

N. odorum Soland.; see *N. indicum* Mill.

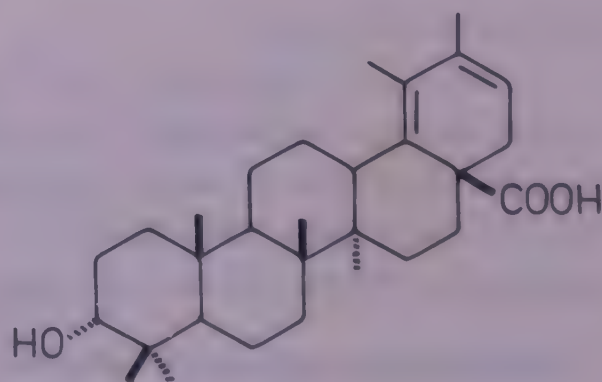
N. oleander L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 448).

Isolation and structure determination of cardiac glycosides - kaneroside and neriumoside - from fresh winter leaves (*Phytochemistry* 1987, 26, 237); isolation of a new triterpene - kaneric acid - from leaves and its characterisation; uvaol also isolated (*J. Nat. Prod.* 1986, 49, 1086); two new triterpenoids - neriucoumaric and isoneriucoumaric acids - isolated from leaves and their structures elucidated (*Planta Med.* 1987, 53, 424); isolation of another new pentacyclic triterpene - oleanderol - from fresh leaves along with betulin and betulinic, ursolic and oleanolic acids (*J. Nat. Prod.* 1988, 51, 229); a new labdane diterpene - oleanderoic acid - isolated along with oleanderen (12-ursene), from leaves and its structure determined (*Planta Med.* 1988, 54, 232); new triterpenes - kanerin and 12,13-dihydroursolic acid - obtained from leaves and structure of kanerin established as 24-nor-3 β ,5-dihydroxyursa-4(23),18-dien-28-oic acid (*J. Nat. Prod.* 1989, 52, 57); another new triterpenoid - kanerocin - isolated from fresh leaves, along with ursolic and oleanolic acids, and its structure elucidated (*Planta Med.* 1989, 55, 292); two more triterpenes - oleanderolic acid and kanerodione - from leaves and their characterisation (*Phytochemistry* 1989, 28, 1187).

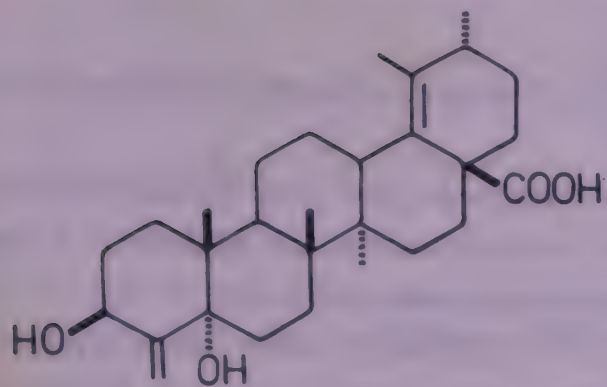
NEW COMPOUNDS



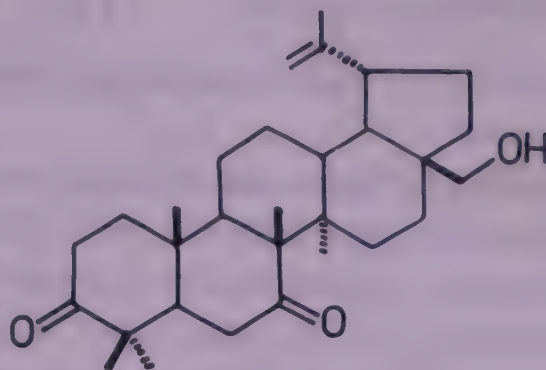
Kaneroside



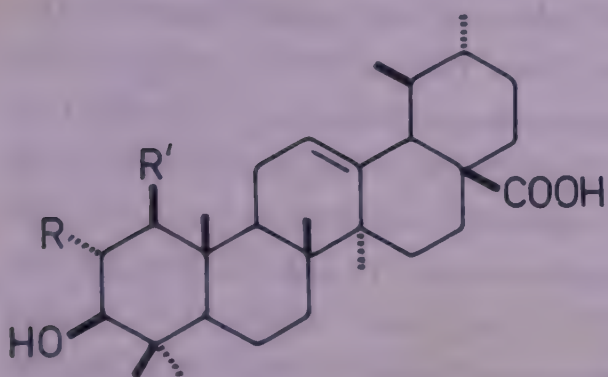
Kanerocin



Kanerin



Kanerodione



Kaneric acid

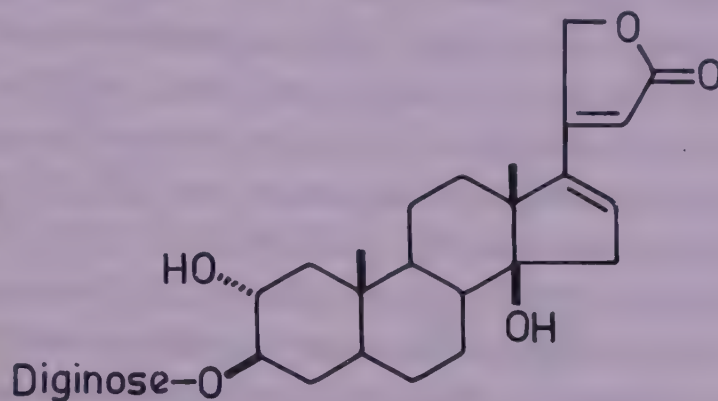
$R = H, R' = OH$

Neriuicoumaric acid

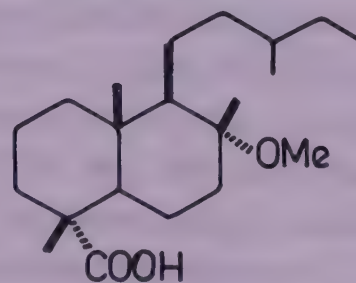
$R = O-(E)p\text{-Coumaroyl}, R' = H$

Isoneriuicoumaric acid

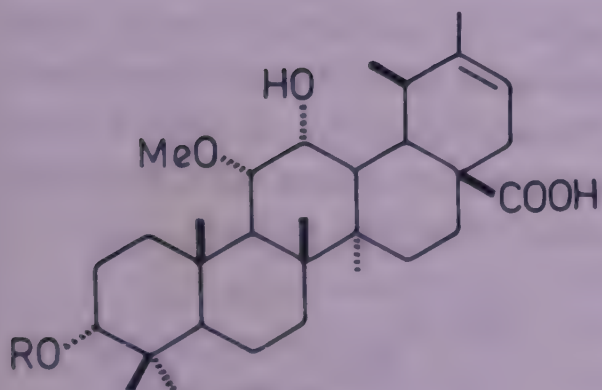
$R = O-(Z)p\text{-Coumaroyl}, R' = H$



Neriumoside

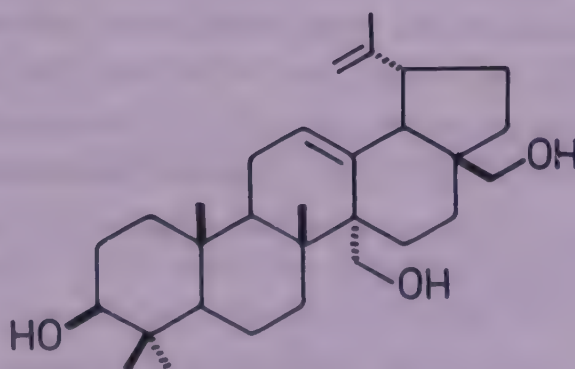


Oleanderoic acid



Oleanderolic acid

$R = p\text{-Hydroxyphenyl}$



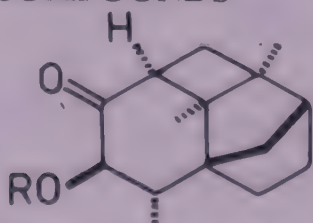
Oleanderol

NICOTIANA (Solanaceae)

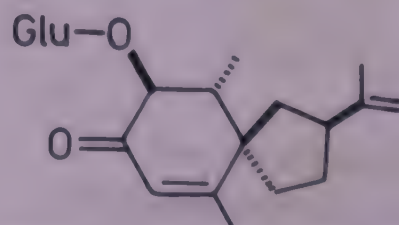
N. tabacum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 449).

Rishitin-1,2-diglucoside obtained from leaves of Japanese plant (Jpn. 59,128,398 (1984) Jan. 10; *Chem. Abstr.* 1985, 102, 21471 v); isolation, characterisation and synthesis of a new cembranoid - 4,8-dimethyl-11-isopropyl-6,8-dihydroxypentadeca-4,9-dien-14-on-1-al (Z. *Naturforsch.* 1984, 39C, 1023; *Chem. Abstr.* 1985, 102, 129084 j); a new sesquiterpenoid glycoside - 3 β -hydroxysolanascone-3-O-sophoroside - isolated from leaves (Jpn. 59,141,595 (1984) Aug. 14; *Chem. Abstr.* 1985, 102, 43118 m; *Agric. Biol. Chem.* 1985, 49, 2537); two more sesquiterpene glycosides - 3 β -hydroxysolavetivone-3-O-glucoside and a rishitin glycoside (I) - obtained from leaves and characterised (*Agric. Biol. Chem.* 1985, 49, 2537); isolation of five new cembranoids from Greek plant and their characterisation as (1S,2E,4S,7E,11S,12S)11,12-epoxy-4-hydroxy-2,7-cembradien-6-one (II), (1S,2E,4S,7E,10E,12S)4,12-dihydroxy-2,7,10-cembratrien-6-one (III), (1S,2E,4S,8R,11S,12E)8,11-epoxy-2,12-cembradien-6-one (IV), (1S,2E,4S,8R,11S)8,11-epoxy-4-hydroxy-2,12(20)-cembradien-6-one (V) and (1S,2E,4S,8R,11S,12R)4,12-dihydroxy-8,11-epoxy-2-cembren-6-one (VI) (*J. Org. Chem.* 1985, 50, 4527); another new cembranoic diterpene isolated from flowers and characterised as (1S,2E,4S,6E,8S,11S) 11-hydroperoxy-2,6,12(20)-cembratrien-4,8-diol (VII) (*Agric. Biol. Chem.* 1986, 50, 1917); two more cembranoids isolated and characterised as (1S,2E,4S,6R,7R,8R,11E) (VIII) and (1S,2E,4S,6R,7S,8S,11E)7,8-epoxy-2,11-cembradien-4,6-diols (IX) (*Acta Chem. Scand.* 1986, 40B, 855); an improved method developed for extraction of nicotine from leaves (*Res. Ind.* 1986, 31, 236; *Chem. Abstr.* 1987, 106, 192797 s); a pectic polysaccharide isolated from cell walls of leaves consisted of galacturonic acid, rhamnose, arabinose and galactose in molar ratio of 88.2:2.8:3.1:5.9 respectively (*Carbohydr. Res.* 1986, 158, 205; *Chem. Abstr.* 1987, 106, 135253 n); 2,4'-dipyridyl and 4,4'-dipyridyl identified (*J. Nat. Prod.* 1986, 49, 1156); (5R,6S,7E, 9S)7-megastigmene-5,6,9-triol isolated and its structure determined (*Acta Chem. Scand.* 1987, 41B, 455); isolation and characterisation of a new diterpene (X) from flowers (Jpn. 62,148,439 (1987) Jul. 02; *Chem. Abstr.* 1988, 108, 35009 k); isolation of 18-oxo-3-virgene from flowers and its structure determination by X-ray studies (*Phytochemistry* 1987, 26, 3029); n-pentacosane-8,10-dione, n-nonacosane-8,10-dione, n-heptacosane-10,12-dione and n-hentriacontane-10,12-dione isolated from stigma lipids (*Agric. Biol. Chem.* 1988, 52, 2341).

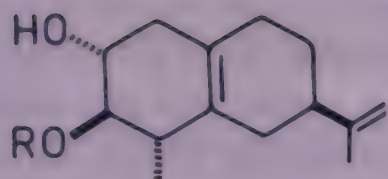
NEW COMPOUNDS



3 β -Hydroxysolanascone-3-O-sophoroside
R = Glu(2 \rightarrow 1)Glu

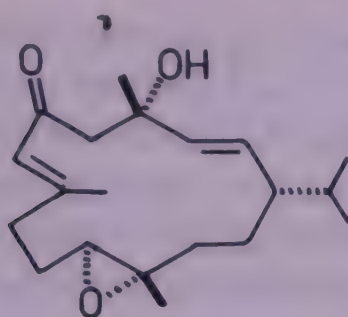


3 β -Hydroxysolavetivone-3-O-glucoside

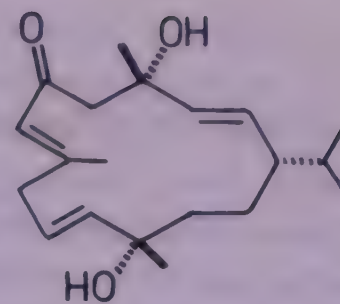


I

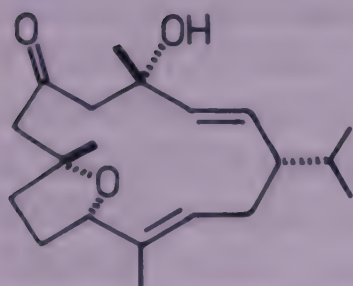
R = Glu(4→1)Glu(4→1)Rha



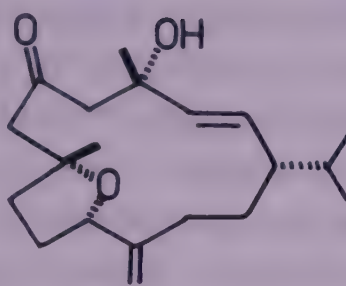
II



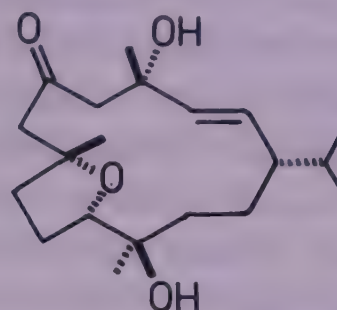
III



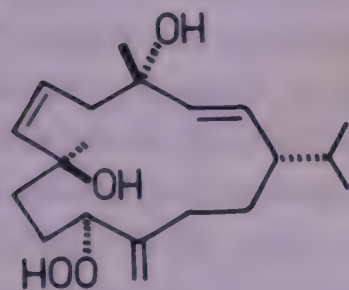
IV



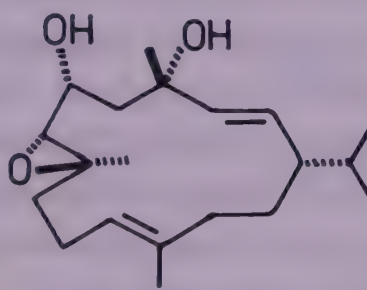
V



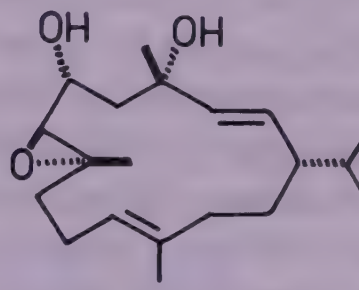
VI



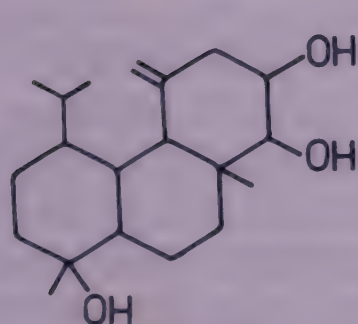
VII



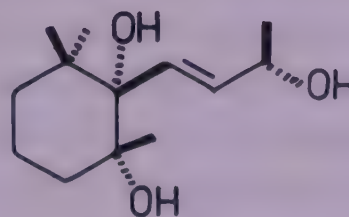
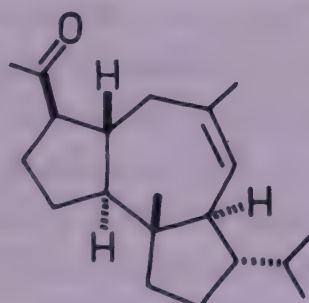
VIII



IX



X



18-Oxo-3-virgene (5R,6S,7E,9S)7-Megastigmene-5,6,9-triol

BIOLOGICAL ACTIVITY

Intracerebroventricular administration of (+)nicotine (1.0 mg) to urethane-anaesthetised rats increased gastric acid secretion. When (+)nicotine (0.05 mg) was administered with (-)nicotine (0.005 mg), (-)nicotine-induced increase in gastric secretion was blocked. Convulsion induced by (-)nicotine in mice also inhibited by pretreatment with (-)nicotine. These results suggested that (+)nicotine had both agonistic and antagonistic action to (-)nicotine in central nervous system (*Jap. J. Pharmacol.* 1985, 37, 215); effects of nicotine

before and after administration of adrenoceptor blockers determined on dogs. Nicotine (0.025 mg/kg, i.v., over 10 min) caused significant pressor response and increase in jejunal blood flow. Oxygen consumption was significantly reduced during first 5 min of nicotine infusion, then returned to control level, thereafter rose above control level post-infusion. Nicotine caused hyperglycaemia during and for about 1 hr after infusion. Glucose uptake in post-infusion period in β -blocked animals rose to higher level than in untreated animals. The observed hyperglycaemia was possibly caused by action of nicotine on bowel glucose uptake or through release of catecholamines and by activation of β -adrenoceptors (*Brit. J. Pharmacol.* 1985, 85, 797); twenty four hr after nicotine (1.5 mg/kg/day) treatment in rats, spontaneous locomotor activity in response to apomorphine or (+)amphetamine and binding of [3H]spiperone to striatal particulates determined. Nicotine treatment did not affect apomorphine-induced locomotor activity, however (+)amphetamine-stimulated activity was attenuated. Results suggested that nicotine acutely alters presynaptic dopaminergic activity without significantly affecting postsynaptic dopaminergic function (*J. Pharm. Pharmacol.* 1986, 38, 920).

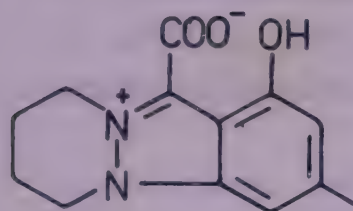
Nicotine produced a transient contraction of isolated iris sphincter muscle, a parasympathetic ganglion-free tissue of rabbit. The response to nicotine was antagonised by hexamethonium but was insensitive to tetrodotoxin. Mechanism of action of contractile response suggested (*Brit. J. Pharmacol.* 1988, 95, 459); nicotine produced transient contraction of isolated strips of guinea pig urinary bladder and this response was antagonised by nicotinic receptor antagonist, hexamethonium, but was insensitive to tetrodotoxin. Nicotine induced contractions possibly through interaction with nicotinic receptors located on terminals of parasympathetic cholinergic, sympathetic non-adrenergic and non-sympathetic purinergic nerves in guinea pig detrusor strips (*Brit. J. Pharmacol.* 1988, 95, 465); the effects of nicotine and caffeine, at dose levels approximating that for human consumption, on skeleton development investigated in rats. Combined administration of nicotine and caffeine (25.0 mg/kg each, i.v.) on gestational day 6 and evaluation of fetal skeletal system on gestational day 20 revealed decrease in number of complete sternal ossification centres, as well as delay in ossification of skull and face. Co-teratogenic effect was evident between nicotine and caffeine as determined by increased incidence of delayed and abnormal skeletal development (*Anat. Anz.* 1989, 168, 109; *Chem. Abstr.* 1989, 111, 108972 t).

Cembranoic diterpene (VII) at 1.9 mM inhibited action of 0.57 μ M IAA by 50% in *Avena* curvature test (*Agric. Biol. Chem.* 1986, 50, 1917); n-pentacosane-8,10-dione, n-nonacosane-8,10-dione, n-heptacosane-10,12-dione and n-hentriacontane-10,12-dione exhibited antioxidant activity (*Agric. Biol. Chem.* 1988, 52, 2341).

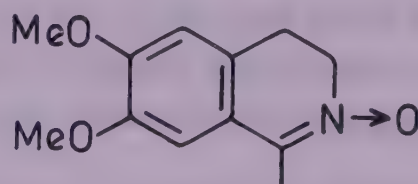
NIGELLA (Ranunculaceae)

N. sativa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 452).

A new isoquinoline alkaloid - nigellimine N-oxide - isolated from seeds and its structure elucidated (*Heterocycles* 1985, 23, 953); another alkaloid - nigellicine - from seeds and its structure determination by X-ray analysis (*Tetrahedron Lett.* 1985, 26, 2759); avenasterol-5-ene, avenasterol-7-ene, campesterol, cholesterol, citrostadienol, cycloecualenol, 24-ethyllophenol, gramisterol, lophenol, 24-methyllophenol, obtusifoliol, sitosterol, stigmastanol, stigmasterol and stigmasterol-7-ene, β -amyrin, butyrospermol, cycloartenol, 24-methylene-cycloartanol, taraxerol, tirucallol and arachidic, linoleic, linolenic, myristic, oleic, palmitic, palmitoleic and stearic acids present in seed oil (*Phytochemistry* 1986, 25, 761); a saponin isolated from seeds and characterised as 3-O- $[\beta$ -D-xylopyranosyl(1 \rightarrow 3)- α -L-rhamnopyranosyl(1 \rightarrow 2)- α -L-arabinopyranosyl]-28-O- $[\alpha$ -L-rhamnopyranosyl(1 \rightarrow 4)- β -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranosyl]-hederagenin (*Phytochemistry* 1988, 27, 3977).

NEW COMPOUNDS

Nigellicine



Nigellimine N-oxide

NILGIRIANTHUS (Acanthaceae)

N. heyneanus (Nees) Bremek. syn. *Strobilanthes heyneanus* Nees

Aqueous extract at 0.4 g/kg showed significant CNS depressant and at 0.1 g/kg analgesic activities in mice; its LD₅₀, i.p., was 1.75 g/kg. Petroleum ether extract at 0.2 g/kg also showed CNS depressant activity and at 10.0 μ g/ml dose nonspecific spasmolytic activity in isolated rat uterus. Chloroform extract at 0.1 mg/kg exhibited analgesic activity and at 10.0 μ g/ml antagonised oxytocin and 5-HT-induced contractions whereas ethanolic extract (10.0 μ g/ml) antagonised only 5-HT-induced spasm. LD₅₀ of petroleum ether extract was 0.6 g/kg, i.p. and of chloroform extract 0.65 g/kg, i.p.; with ethanolic extract no death observed upto 2.0 g/kg, i.p. (*J. Res. Ayurveda & Siddha* 1987, 8, 113); ethanolic and aqueous (0.1 g/kg, each) extracts of stem exhibited analgesic, anti-inflammatory and immunosuppressant effects. Both extracts produced significant decrease in acetic acid-induced writhing in mice. Both suppressed carrageenin hind paw oedema and cotton pellet granuloma formation in rats. In mice treated with extracts marked suppression of antibody formation against sheep red blood cells was observed; LD₅₀ of ethanolic extract was 2.0 g/kg, i.p., and of aqueous extract 0.5 g/kg, i.p. (*J.*

Res. Ayurveda & Siddha 1987, 8, 53; *ibid.* 1988, 9, 156); petroleum ether extract of stem showed anti-inflammatory activity in rats, weak anticonvulsant activity in mice and antagonised prostaglandin F_{2α}- and 5-HT-induced spasms in rat uterus, whereas chloroform extract antagonised oxytocin-induced spasm in rat uterus and also showed weak anticonvulsant activity; LD₅₀ of petroleum ether and chloroform extract 0.74 g/kg, i.p. and 1.28 g/kg, i.p. respectively (*J. Res. Ayurveda & Siddha* 1988, 9, 156).

Distribution : Western Ghats and Nilgiris.

NIPHOBOLUS (Polypodiaceae)

N. heteractis Bedd.; see *Pyrrhosia lingua* (Thunb.) Farwell

NOTHAPODYTES (Icacinaceae)

N. foetida (Wt.) Sleum.; see *N. nimmoniana* (Graham) Mabberley

N. nimmoniana (Graham) Mabberley syn. *Mappia foetida* (Wt.) Miers, *M. oblonga* Miers var. *elliptica* Miers, *M. ovata* Miers, *M. tomentosa* Miers, *Nothapodytes foetida* (Wt.) Sleum. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 453).

A new camptothecin derivative - 20(S)18,19-dehydrocamptothecin - isolated from wood and characterised (*Phytochemistry* 1988, 27, 3663).

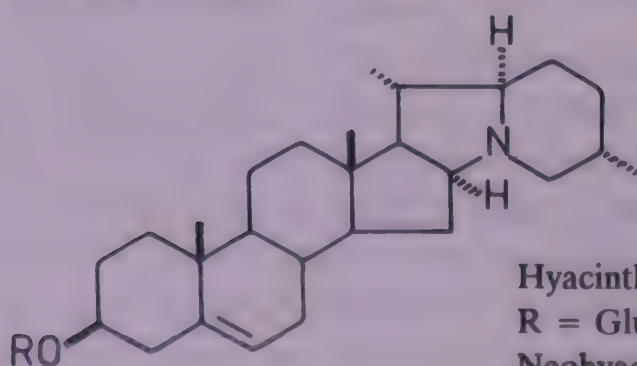
NOTHOLIRION (Liliaceae)

N. bulbiferum (Lingelsh.) Stearn syn. *Lilium hyacinthinum* E.H.Wilson, *Notholirion hyacinthinum* (E.H.Wilson) Stapf

A new steroidal alkaloid - hyacinthoside - isolated from bulbs along with β-chaconine and solanidine-3-O-α-L-rhamnopyranosyl(1→2)[β-D-glucopyranosyl(1→4)]-β-D-glucopyranoside; structure of new alkaloid determined (*Yaoxue Xuebao* 1986, 21, 177; *Chem. Abstr.* 1986, 105, 21663 v); another steroidal alkaloid - neohyacinthoside - isolated from bulbs and characterised (*Yaoxue Xuebao* 1988, 23, 61; *Chem. Abstr.* 1988, 109, 51701 f).

Distribution : Himalayas, from Nepal to Arunachal Pradesh, alt. 3200-4100 m.

NEW COMPOUNDS



Hyacinthoside

R = Glu[(2→1)Rha](4→1)Glu(3→1)Glu

Neohyacinthoside

R = Glu[(2→1)Rha](4→1)Glu(3→1)Glu(6→1)Glu

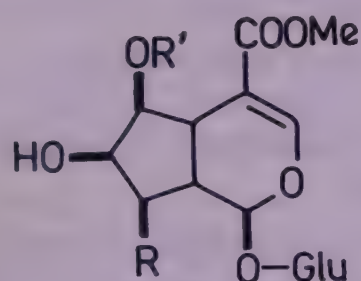
N. hyacinthinum (E.H.Wilson) Stapf; see *N. bulbiferum* (Lingelsh.) Stearn

NYCTANTHES (Oleaceae)

N. arbor-tristis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 453).

A polysaccharide isolated from seeds comprised of glucose and mannose in molar ratio of 1:3 (*J. Indian Chem. Soc.* 1985, 62, 627); two new iridoid glucosides - arbortristosides A and B - from seeds and their characterisation (*Phytochemistry* 1985, 24, 773); another iridoid glucoside (I) along with arbortristoside A, friedelin, 6 β -hydroxyloganin, nyctanthic acid, oleanolic acid and β -sitosterol glucoside isolated from seeds; methyl ether of (I) found to be identical with arbortristoside A (*Phytochemistry* 1989, 28, 1913).

NEW COMPOUNDS



Arbortristoside A

R = Me, R' = p-Methoxycinnamoyl

Arbortristoside B

R = CH₂OH, R' = Caffeoyl

I

R = Me, R' = p-Hydroxycinnamoyl

NYMPHAEA (Nymphaeaceae)

N. stellata Willd. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 453).

Coclaurine and β -sitosterol isolated from aerial parts (*J. Indian Chem. Soc.* 1986, 63, 530).

OCHNA (Ochnaceae)

O. obtusa DC. var. *pumila* (Buch.-Ham. ex DC.) Kanis syn. *O. pumila* Buch.-Ham. ex DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 454).

Tetrahydroamentoflavone, 7''-O-methyl-tetrahydroamentoflavone, ochnaflavone and 7''-O-methylochnaflavone isolated from leaves (*Phytochemistry* 1987, 26, 1171).

O. pumila Buch.-Ham. ex DC.; see *O. obtusa* DC. var. *pumila* (Buch.-Ham. ex DC.) Kanis

OCHROSIA (Apocynaceae)

O. borbonica J.F.Gmel.; see *Neisosperma oppositifolium* (Lamk.) Fosb. & Sach.

O. elliptica Labill (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 454).

Ellipticine synthesised (*Chem. Commun.* 1984, 926).

O. oppositifolia (Lamk.) K. Schum.; see *Neisosperma oppositifolium* (Lamk.) Fosb. & Sach.

OCIMUM (Lamiaceae)

O. adscendens Willd.

A mucilaginous polysaccharide composed of galactose, galacturonic acid and rhamnose isolated from seeds (*Phytochemistry* 1984, 23, 2243).

Distribution : Central, eastern and southern India, in plains.

O. americanum L. syn. *O. canum* Sims. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 454).

Linalool (60.90%), bergamotene, β -caryophyllene, 1-octen-3-ol and 3-octanol identified by GLC in oil of plant grown in Rwanda (*Pharm. Weekbl., Sci. Ed.* 1986, 7, 273; *Chem. Abstr.* 1986, 104, 135843 p); eugenol identified as major constituent in leaf oil by GC-MS (*Flavour Fragrance J.* 1989, 4, 17; *Chem. Abstr.* 1989, 111, 28406 w).

O. basilicum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 455).

Juvocimene I and juvocimene II isolated from oil and their structures determined and confirmed by synthesis (*J. Chem. Ecol.* 1984, 10, 1453; *Chem. Abstr.* 1985, 102, 75696 q); leaves afforded thymol, xanthomicrol and butyl caffeate (*Planta Med.* 1988, 54, 190); methyleugenol (33.95) and eugenol (23.1%) determined as major components in supercritical carbon dioxide extract of oil by GC-MS (*J. Essent. Oil Res.* 1989, 1, 97; *Chem. Abstr.* 1989, 111, 12322 c).

NEW COMPOUNDS

Juvocimene I

R = CH = CMe₂

Juvocimene II

R = 3,3-Dimethyl-2-oxiranyl

O. canum Sims.; see *O. americanum* L.

O. gratissimum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 455).

Chromatographic fractions of extract of leaves contracted guinea pig ileum and rat colon and raised arterial blood pressure in rats (*J. Ethnopharmacol.* 1986, 18, 3; *Chem. Abstr.* 1987, 106, 96122 x).

O. kilimandscharicum Guerke (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 496).

Camphor (35.2), limonene (16.5) and camphene (8.12%) determined in oil of Brazilian plant (*Essenze Deriv. Agrum.* 1984, 54, 91; *Chem. Abstr.* 1985, 103, 165909 m).

O. sanctum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 456).

Leaf extract enhanced anti-SRBC haemagglutination titre and IgE antibody titre, as measured by passive cutaneous anaphylaxis in rats; antigen-induced histamine release from peritoneal mast cells of sensitised rats *in vitro* was significantly inhibited by it; it also antagonised responses to various spasmogens by isolated guinea pig ileum. Thus, leaf extract modulates humoral immune responses (*Indian J. Med. Res.* 1987, 87, 384); extract of leaves also showed highly significant clinical and biochemical clearance of viral hepatitis in 14 days of treatment (*J. Res. Ayurveda & Siddha* 1988, 9, 118).

Leaves and flowers contained 0.075 and 0.095% of oil respectively; detection of cadinene, 1,8-cineole, eugenol, limonene and methylchavicol in leaf oil and cadinene, β -caryophyllene, eugenol and humulene in flower oil by GLC (*Top. Flavour Res., Proc. Int. Conf.* 1985, 277; *Chem. Abstr.* 1986, 104, 39497 h); leaves afforded β -carotene and ursolic acid (*Fitoterapia* 1987, 58, 286); determination of caryophyllene (37.63), bornyl acetate (23.17) and eugenol (21.24%) in essential oil (*Plant. Med. Phytother.* 1988, 22, 280; *Chem. Abstr.* 1989, 111, 180543 w).

OLDENLANDIA (Rubiaceae)

O. diffusa (Willd.) Roxb.; see *Hedyotis diffusa* Willd.

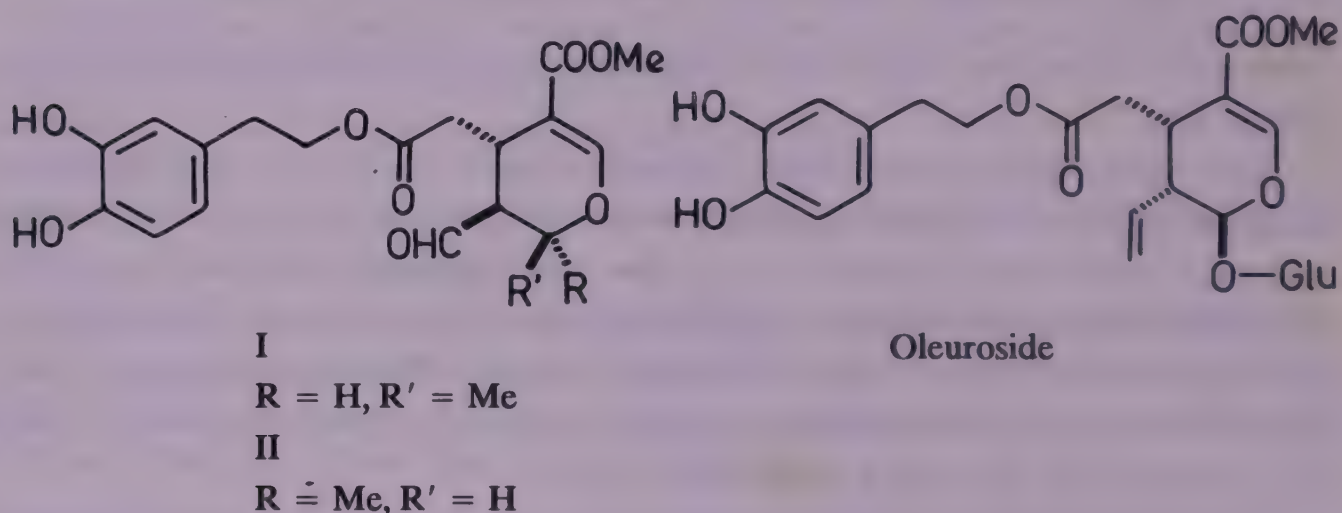
OLEA (Oleaceae)

O. europaea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 458).

Erythrodiol, oleanolic acid, oleuropein and uvaol identified in leaf extract by HPLC (*Riv. Ital. Sostanze Grasse* 1984, 61, 549; *Chem. Abstr.* 1985, 102, 201165 f); fruits afforded oleanolic and maslinic acids (*Khim. Prii. Soedin.* 1985, 125; *Chem. Abstr.* 1985, 102, 182446 e); (+)1-acetoxypinoresinol-4'- β -D-glucoside, its 4''-O-methyl ether, (+)1-hydroxypinoresinol-1 β -

D-glucoside, (+)1-hydroxypinoresinol-4'- β -D-glucoside and (+)fraxiresinol-1 β -D-glucoside isolated from bark (*Chem. Pharm. Bull.* 1985, 33, 1232); synthesis of oleuropeic acid (*Synth. Commun.* 1985, 15, 165; *Chem. Abstr.* 1985, 103, 88092 k); demethyleuropein, oleuropein and its 7-methyl ester isolated from bark (*Shoyakugaku Zasshi* 1985, 39, 90; *Chem. Abstr.* 1985, 103, 157299 x); isolation of two new seco-iridoids (I and II) from leaves and their structure determination; oleoside and ligstroside also obtained (*Phytochemistry* 1986, 25, 865); another seco-iridoid glucoside - oleurosides - isolated from leaves and characterised as secoxyloganin-3,4-dihydroxyphenethyl ester (*Phytochemistry* 1988, 27, 1757); a xyloglucan containing a (1 \rightarrow 4)- β -D-glucan backbone bearing α -D-xylose, α -L-arabinose and β -D-galactose units, isolated from pulp (*Carbohydr. Res.* 1988, 181, 278; *Chem. Abstr.* 1988, 109, 187381 j).

NEW COMPOUNDS



OLIGOCHAETA (Asteraceae)

O. ramosa (Roxb.) Wagenitz; see *Amberboa ramosa* (Roxb.) Jafri

ONOSMA (Boraginaceae)

O. echioides L.; see *O. hispidum* Wall. ex D. Don

O. hispidum Wall. ex D. Don syn. *O. echioides* sensu Clarke (non L.), *O. kashmiricum* Johnston (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 181).

A new aliphatic ketone isolated and characterised as 5-nonacosanone (*Fitoterapia* 1985, 56, 117).

O. kashmiricum Johnston; see *O. hispidum* Wall. ex D. Don

ONYCHIUM (Cryptogrammaceae)

O. auratum Kaulf.; see *O. siliculosum* (Desv.) C. Chr.

O. siliculosum (Desv.) C.Chr. syn. *O. auratum* Kaulf. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 459).

BIOLOGICAL ACTIVITY

Onitin, onitinoside and onitisin inhibited contraction of isolated guinea pig ileum. Onitin (0.1 mM) inhibited both D and M receptors of 5-HT (*Planta Med.* 1985, 51, 148).

OPERCULINA (Convolvulaceae)

O. turpethum (L.) Silva Manso syn. *Ipomoea turpethum* (L.) R.Br. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 499).

Betulin, lupeol and β -sitosterol isolated from stem (*Acta Cienc. Indica, Chem.* 1987, 13, 171; *Chem. Abstr.* 1989, 111, 36647 r).

OPHELIA (Gentianaceae)

O. chirata Griseb.; see *Swertia chirayita* (Roxb. ex Flem.) Kars.

OPHIOPOGON (Liliaceae)

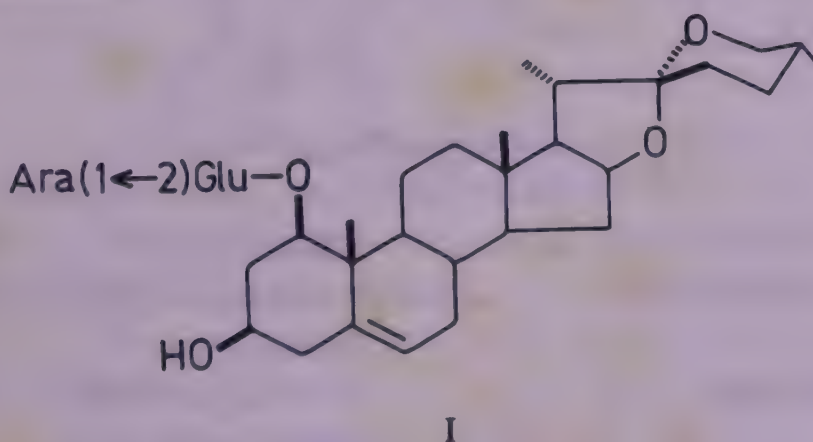
O. intermedius D.Don syn. *O. wallichianum* (Kunth) Hook.f.

B. - Piyajimurba.

Dioscin, diosgenin, n-octacosanol, ruscogenin, β -sitosterol and its glucoside isolated from rhizomes (*Pharmazie* 1988, 43, 143; *Chem. Abstr.* 1988, 108, 201787 j); a new ruscogenin glycoside isolated from rhizomes and characterised as ruscogenin-1-O-[α -L-arabinopyranosyl (1 \rightarrow 2)]- β -D-glucopyranoside (I) (*Phytochemistry* 1988, 27, 3326).

Distribution : Himalayas, from Kashmir to Sikkim, Meghalaya, Manipur, Orissa and hills of south India, alt. 900-3100 m.

NEW COMPOUNDS



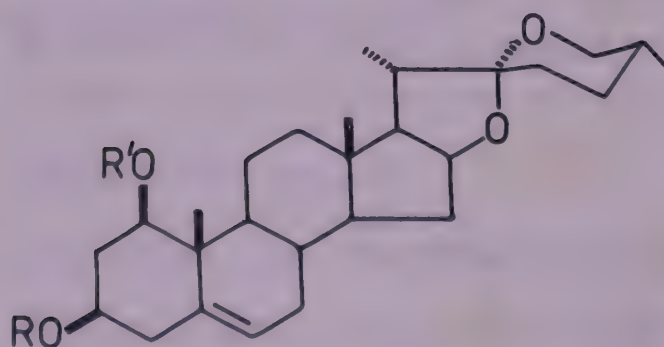
O. japonicus Ker-Gawl.

Structure of ophiopogonin B, previously isolated from tubers, established to be ruscogenin- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-fucopyranoside (*Chem. Pharm. Bull.* 1972, 20, 1729);

ophiopogonin D isolated from tubers and its structure elucidated as ruscogenin- α -L-rhamnopyranosyl(1 \rightarrow 2)[β -D-xylopyranosyl(1 \rightarrow 3)]- β -D-fucopyranoside (*Chem. Pharm. Bull.* 1973, 21, 308); isolation of ophiopogonins A, C, B', C' and D' from tubers and their characterisation as ruscogenin-1-O-[(3-O-acetyl)- α -L-rhamnopyranosyl(1 \rightarrow 2)]- β -D-fucopyranoside, mono-O-acetylophiopogonin D, diosgenin-3-O-[(4-O-acetyl)- α -L-rhamnopyranosyl(1 \rightarrow 2)][β -D-xylopyranosyl(1 \rightarrow 3)]- β -D-glucopyranoside, diosgenin-3-O- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-glucopyranoside and diosgenin-3-O-[α -L-rhamnopyranosyl(1 \rightarrow 2)][β -D-xylopyranosyl(1 \rightarrow 3)]- β -D-glucopyranoside respectively (*Chem. Pharm. Bull.* 1977, 25, 3049); four new homoisoflavonoidal compounds - methylophiopogonanones A and B, methylophiopogonones A and B - isolated from tubers and their structures established (*Chem. Pharm. Bull.* 1980, 28, 1477; *Yaowu Fenxi Zazhi* 1988, 8, 343; *Chem. Abstr.* 1989, 110, 141636 p); further five new homoisoflavonoidal compounds - ophiopogonones A and B, isoophiopogonone A, desmethylophiopogonone B and ophiopogonanone A - obtained from tubers and characterised (*Chem. Pharm. Bull.* 1980, 28, 2039); synthesis of ophiopogonone A, ophiopogonone B, isoophiopogonone A and ophiopogonanone A (*Ann. Chem.* 1987, 447); identification of 5,7-dihydroxy-6-formyl-8-methyl-3-(3,4-methylenedioxybenzyl)-4-chromanone and β -sitosterol-3-O- β -D-glucoside in rhizomes (*Zhongcaoyao* 1988, 19, 154; *Chem. Abstr.* 1988, 109, 125860 f); borneol-apiosyl(1 \rightarrow 6)glucoside, 6-formyl-7-methoxyisoophiopogonanone B, β -sitosterol and its glucoside isolated from roots (*Zhongguo Zhongyao Zazhi* 1989, 14, 359; *Chem. Abstr.* 1989, 111, 239363 t).

Distribution : Native of Japan and Korea, introduced into India in gardens.

NEW COMPOUNDS



Ophiopogonin A

R = H, R' = Fuc(2 \rightarrow 1)Rha(3-Ac)

Ophiopogonin B

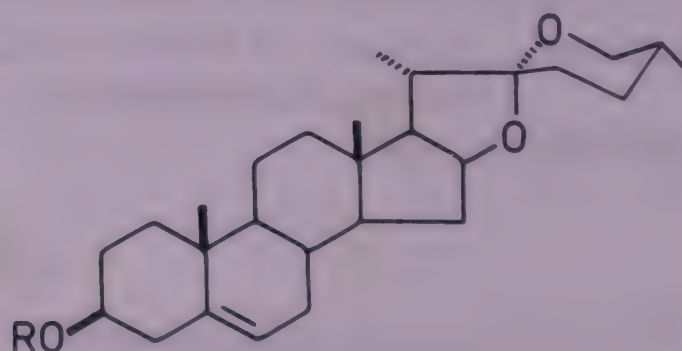
R = H, R' = Fuc(2 \rightarrow 1)Rha

Ophiopogonin C

R = Ac, R' = Fuc[(2 \rightarrow 1)Rha](3 \rightarrow 1)Xyl

Ophiopogonin D

R = H, R' = Fuc[(2 \rightarrow 1)Rha](3 \rightarrow 1)Xyl



Ophiopogonin B'

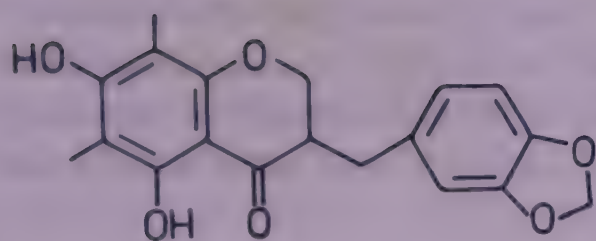
R = Glu[(2 \rightarrow 1)Rha(4-Ac)](3 \rightarrow 1)Xyl

Ophiopogonin C'

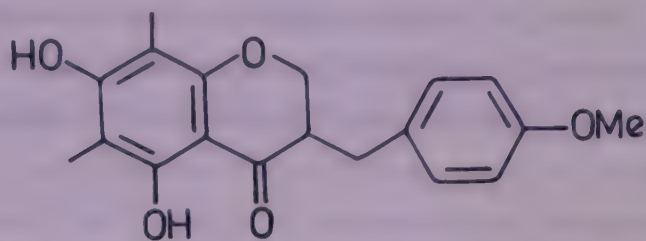
R = Glu(2 \rightarrow 1)Rha

Ophiopogonin D'

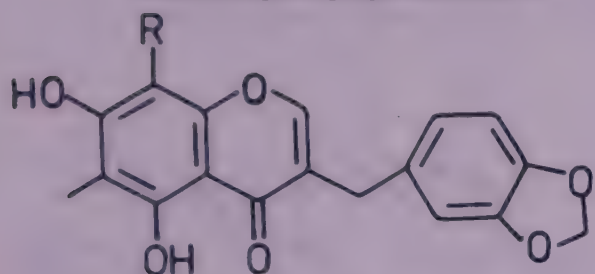
R = Glu[(2 \rightarrow 1)Rha](3 \rightarrow 1)Xyl



Methylophiopogonanone A



Methylophiopogonanone B

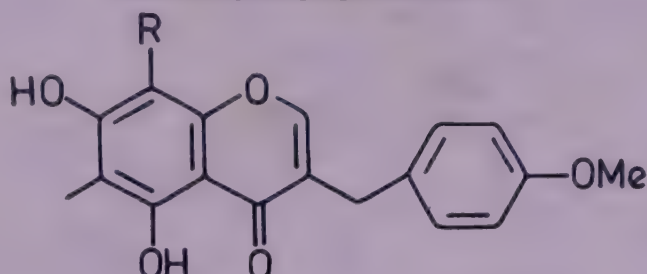


Ophiopogonone A

R = H

Methylophiopogonone A

R = Me

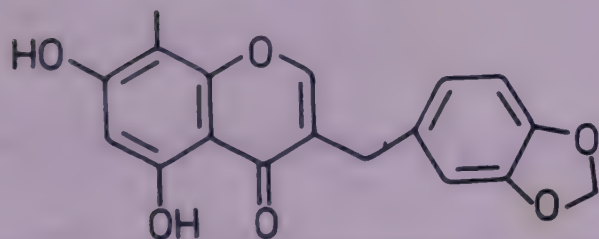


Ophiopogonone B

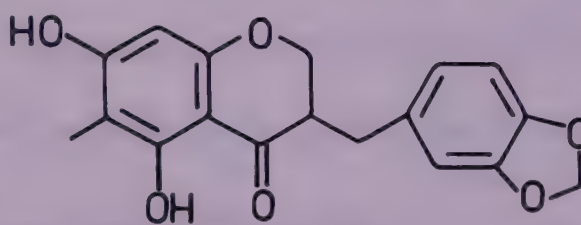
R = H

Methylophiopogonone B

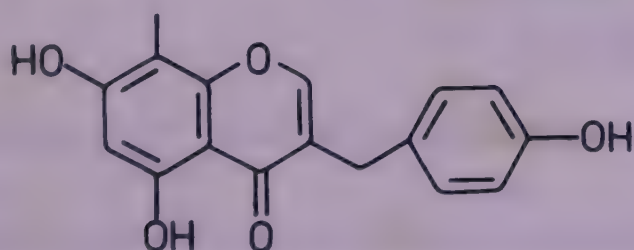
R = Me



Iso-ophiopogonone A



Ophiopogonanone A



Desmethyloiso-ophiopogonone B

O. wallichianum (Kunth) Hook.f.; see *O. intermedius* D.Don

Note : This taxon was inadvertently left out from earlier volumes of this Compendium. Therefore, earlier work has now been included.

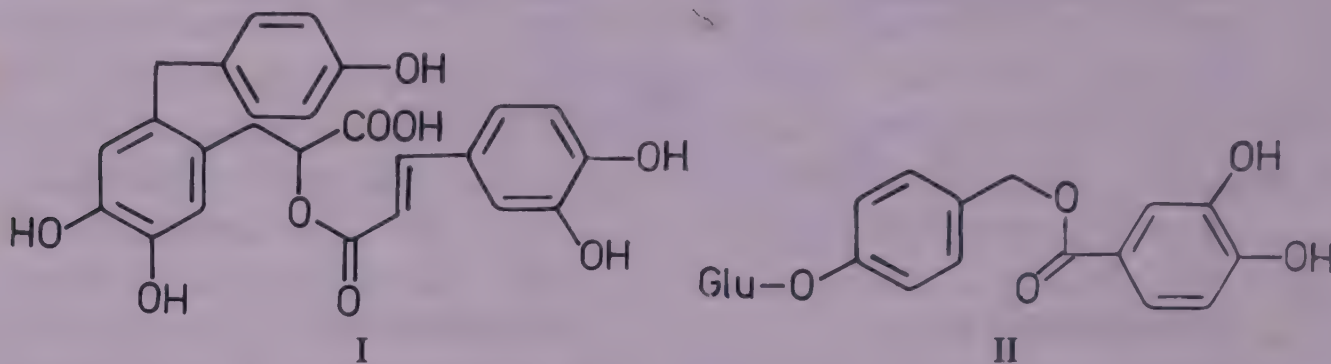
ORIGANUM (Lamiaceae)

O. majorana L.; see *Majorana hortensis* Moench

O. vulgare L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 460).

A new antioxidative glucoside from leaves and characterised as 4-(3,4-dihydroxybenzoyl oxymethyl)phenyl- β -D-glucopyranoside (*Agric. Biol. Chem.* 1987, 51, 2727); isolation and characterisation of a new phenolic acid - 2-caffeoyloxy-3-[2-(4-hydroxybenzyl)-4,5-dihydroxy] phenylpropionic acid (I) and a new glucoside (II) from leaves; caffeic, protocatechuic and rosmarinic acids also isolated (*Agric. Biol. Chem.* 1989, 53, 519).

NEW COMPOUNDS



BIOLOGICAL ACTIVITY

Phenolic acid (I) and glucoside (II) exhibited antioxidant activity comparable to that of BHA (*Agric. Biol. Chem.* 1989, 53, 519).

OROXYLUM (OROXYLON) (Bignoniaceae)

O. indicum (L.) Vent. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 460).

Baicalein-7-O- β -gentiobioside isolated from seeds of Nepalese plant (*Shoyakugaku Zasshi* 1988, 42, 98; *Chem. Abstr.* 1988, 109, 196980 f).

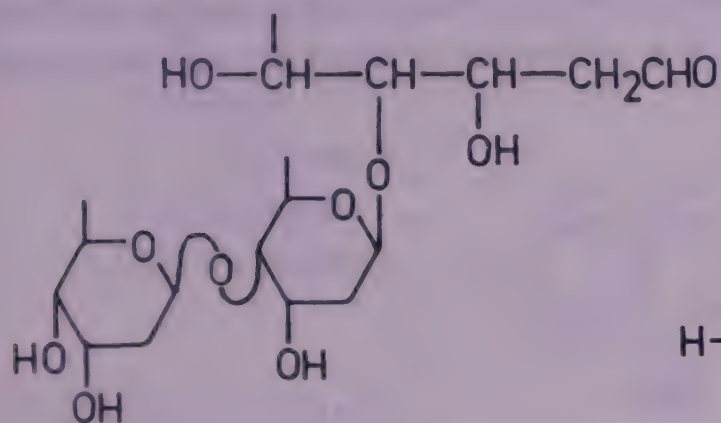
ORTHANTHERA (Asclepiadaceae)

O. viminea Wight & Arn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 461).

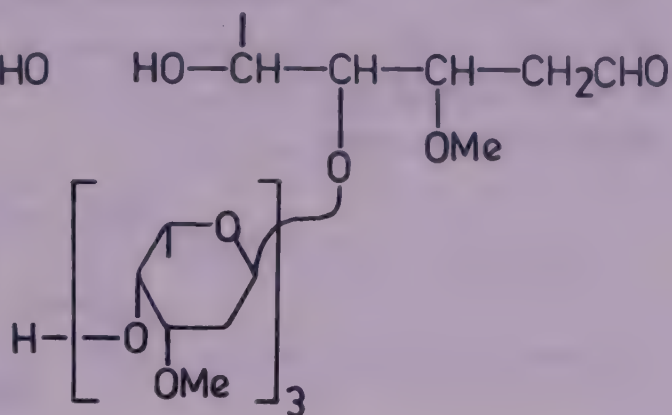
A new trisaccharide - digoxose - isolated from twigs and characterised as O- β -D-digitoxopyranosyl(1 \rightarrow 4)-O- β -D-digitoxopyranosyl(1 \rightarrow 4)- α -D-digitoxopyranose (*Carbohydr. Res.* 1984, 129, 179; *Chem. Abstr.* 1985, 102, 218289 x); isolation of a new tetrasaccharide - vimose - from twigs and its characterisation as O- β -L-diginopyranosyl(1 \rightarrow 4)-O- β -L-diginopyranosyl(1 \rightarrow 4)-O- β -D-diginopyranosyl(1 \rightarrow 4)- α -L-diginopyranose (*J. Carbohydr. Chem.* 1984, 3, 315; *Chem. Abstr.* 1985, 102, 75668 g); a new pregnane genin - orgogenin - isolated and its structure shown to be 20-oxopregn-5-en-3 β ,8 β ,11 α ,12 β ,14 β ,15 α -hexol (*Phytochemistry* 1985, 24, 2391); isolation of a new pregnane ester - ornogenin - and its diglycoside - ornine - from twigs and their structure elucidation as 12,20-di-O-cinnamoylsarcostin and its 3-O- α -L-oleandropyranosyl(1 \rightarrow 4)-O- β -D-cymaropyranoside respectively (*Phytochemistry* 1985, 24, 3007); another glycoside of ornogenin - orine - isolated from twigs and its structure determined

(*Indian J. Chem.* 1985, 24B, 1053); new pregnane ester - orthenine - from twigs and its characterisation (*J. Nat. Prod.* 1985, 48, 928); a polyhydroxy ester - therogenin - isolated and its structure established as 12 β ,20S-di-O-cinnamoyl- 3 β ,5 α ,6 β ,8 β ,14 β ,17 β -hexahydroxypregnane (*Phytochemistry* 1988, 27, 1809).

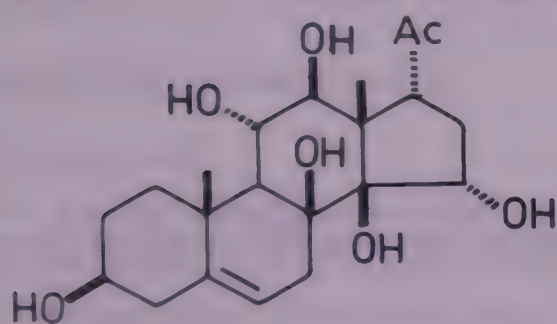
NEW COMPOUNDS



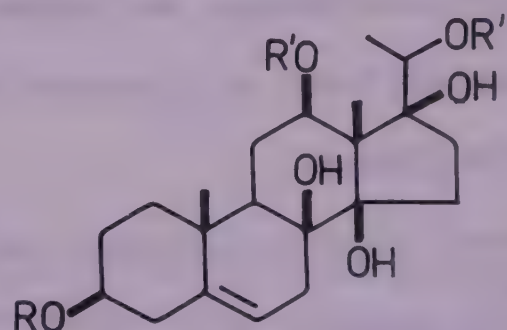
Digoxose



Vimose



Orgogenin



Ornogenin

R = H, R', R'' = Cinnamoyl

Orine

R = Cymarose, R', R'' = Cinnamoyl

Ornine

R = Cymarose(4 \rightarrow 1)oleandrose,

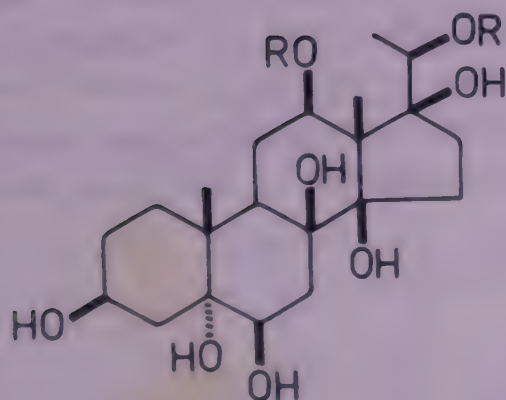
R', R'' = Cinnamoyl

Orthenine

R = Cymarose(4 \rightarrow 1)Oleandrose(4 \rightarrow 1)

Oleandrose(4 \rightarrow 1)Oleandrose,

R' = Cinnamoyl, R'' = H



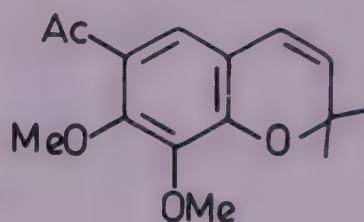
Therogenin

R = Cinnamoyl

ORTHOSIPHON (Lamiaceae)

O. aristatus (Blume) Miq. syn. *O. grandiflorus* Boldingh., *O. stamineus* Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 461).

Palmitic acid (9.51), α -guaiene (7.84), β -selinene (7.84), β -caryophyllene (6.45), its oxide (6.05), and 6,10,14-trimethylpentadecan-2-one (5.76%) determined in leaf essential oil (*Planta Med.* 1986, 52, 240); methylripariochromene A isolated and its crystal structure determined (*J. Nat. Prod.* 1989, 52, 171).

NEW COMPOUNDS

Methylripariochromene A

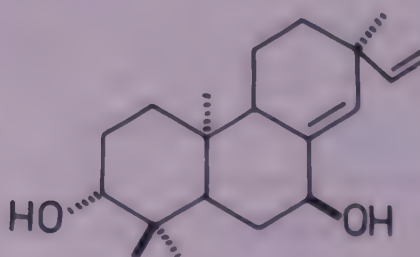
O. grandiflorus Boldingh.; see *O. aristatus* (Blume) Miq.

O. stamineus Benth.; see *O. aristatus* (Blume) Miq.

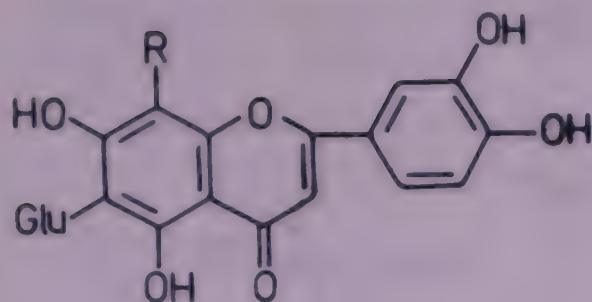
ORYZA (Poaceae)

O. sativa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 462).

New flavone C-glycosides - carlinoside (6-C- β -D-glucopyranosyl-8-C- β -L-arabinopyranosyl luteolin), neocarlinoside, isoscoparine-2''-glucoside [chrysoeriol-6-C- β -D-(2-O- β -D-glucopyranosyl)glucopyranoside] and its 6'''-p-coumaric (I) and ferulic (II) acid esters - along with schaftoside, neoschaftoside and isoorientin-2''-glucoside isolated (*Phytochemistry* 1985, 24, 1061); phytoalexins - (+)oryzalexin A, (+)oryzalexin B and (+)oryzalexin C - synthesised (*Tetrahedron* 1985, 41, 5653); a new phytoalexin - oryzalexin D - isolated from blast-infected leaves and its structure elucidated as (+)3,7-dihydroxysandaracopimaradiene; oryzalexins A, B and C also obtained (*Nippon Noyaku Gakkaishi* 1986, 11, 369; *Chem. Abstr.* 1987, 107, 131074 c).

NEW COMPOUNDS

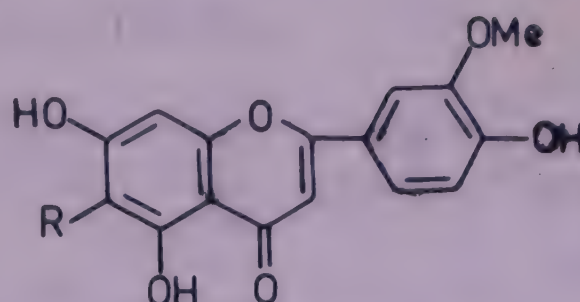
Oryzalexin D



Carlinoside

R = α -Arabinose

Neocarlinoside

R = β -Arabinose

Isoscoparin-2''-glucoside

R = Glu(2 \rightarrow 1)Glu

I

R = Glu(2 \rightarrow 1)Glu(6'''-feruloyl)

II

R = Glu(2 \rightarrow 1)Glu(6'''-p-coumaroyl)

BIOLOGICAL ACTIVITY

Oryzaalexin D at 100 ppm markedly inhibited spore germination of *Piricularia oryzae* (Nippon Noyaku Gakkaishi 1986, 11, 369; Chem. Abstr. 1987, 107, 131074 c).

OSBECKIA (Melastomataceae)

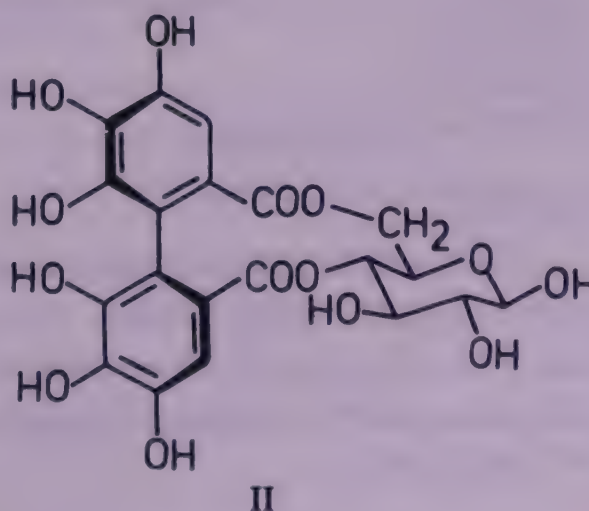
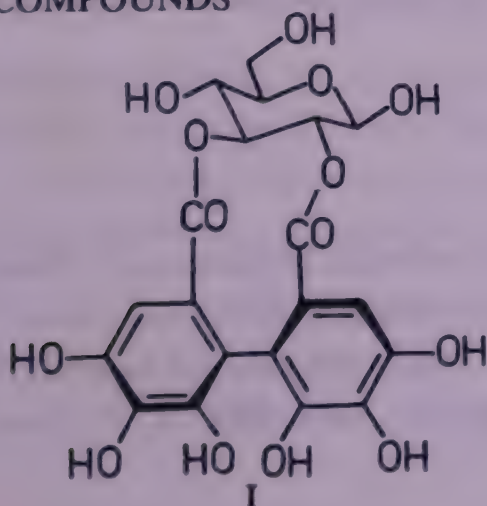
O. chinensis L.

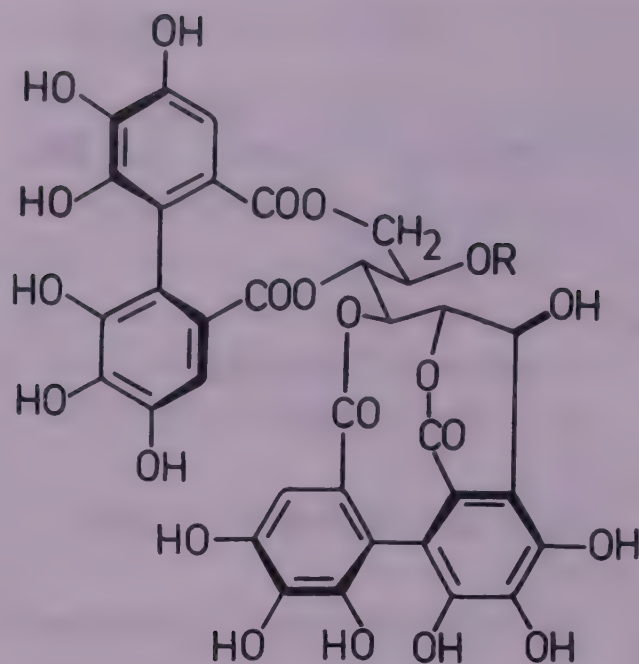
Lushai - Builukham; Mundari - Gara jojo ara.

Kaempferol, its 3-O-glucopyranoside, quercetin, its 3-O-glucopyranoside and 3-O-gentiobioside isolated (Agric. Biol. Chem. 1987, 51, 2801); isolation of six hydrolysable tannins - casuarinin, casuariin, punicaortein A, degalloylpunicaortein A, 2,3[(S)4,4',5,5',6,6'-hexahydroxydiphenoyl]-D-glucopyranoside (I) and 4,6[(S)4,4',5,5',6,6'-hexahydroxydiphenoyl]-D-glucopyranoside (II) - and their characterisation; gallic acid, methyl gallate and ellagic acid also isolated (Phytochemistry 1988, 27, 1315).

Distribution: Himalayas, from Garhwal to Bhutan, north Bengal, Bihar, Meghalaya, Nagaland and Western Ghats, ascending to 1200 m.

NEW COMPOUNDS



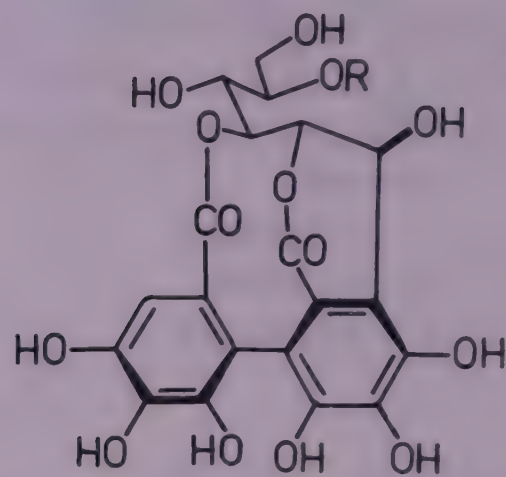


Casuariin

R = H

Casuarinin

R = Galloyl



Punicacortein A

R = Galloyl

Degalloylpunicacortein A

R = H

BIOLOGICAL ACTIVITY

Antioxidative efficiency evaluated in food model system in comparison to known natural antioxidants and found to increase in the order: kaempferol = kaempferol-3-O-glucoside < quercitrin = quercetin-3-O-glucoside < α -tocopherol = BHA (*Agric. Biol. Chem.* 1987, 51, 2801); antioxidative efficiency, using thiocyanate and TBA methods, increased in the order: gallic acid < α -tocophero < methyl gallate < degalloylpunicacortein A < punicacortein A < I = II < casuariin < casuarinin = BHA < ellagic acid. Antioxidant activity *in vitro* was in the order: α -tocopherol < gallic acid < methyl gallate < degalloylpunicacortein A < punicacortein A = I = II < ellagic acid < casuariin < casuarinin in rabbit erythrocyte membrane ghost system and ellagic acid < degalloylpunicacortein A < gallic acid < punicacortein A = I = II < methylgallate < casuariin < casuarinin = tocopherol in rat liver microsomal system (*Phytochemistry* 1988, 27, 1315).

OSMUNDA (Osmundaceae)

O. regalis L.

Caffeic, p-hydroxybenzoic and p-coumaric acids isolated from rhizomes, leaf bases, roots and fronds; gallic, vanillic, salicylic and ferulic acids present in hydrolysed extract (*An. R. Acad. Farm.* 1987, 53, 91; *Chem. Abstr.* 1987, 107, 214857 m); catechol tannins (2.8) and gallotannins (0.09%) estimated in rhizomes (*An. R. Acad. Farm.* 1987, 53, 97; *Chem. Abstr.* 1987, 107, 214858 n).

Distribution : Throughout hilly regions of India, alt. 1200-1800 m.

BIOLOGICAL ACTIVITY

Tannins (2.89 g) showed haemagglutinating activity equivalent to 10.0 g of tannic acid (*An. R. Acad. Farm.* 1987, 53, 97; *Chem. Abstr.* 1987, 107, 214858 n).

OSTODES (Euphorbiaceae)

O. paniculata Blume (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 463).

A new cytotoxic fatty acid - ostopanic acid - isolated from stems and fruits and characterised as 7,12-dioxooctadeca-8(E),10(E)-dien-1-oic acid (*J. Nat. Prod.* 1987, 50, 281).

BIOLOGICAL ACTIVITY

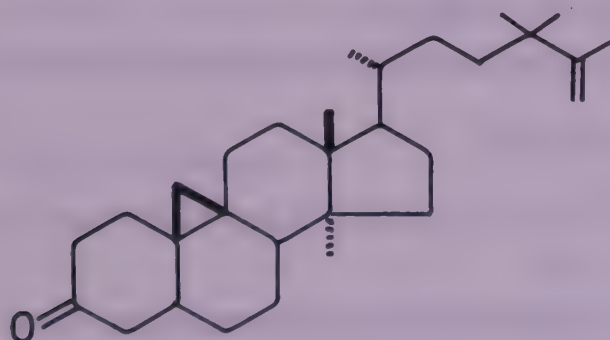
ED₅₀ of ostopanic acid, 1.5 µg/ml in P-388 lymphocytic leukaemia system (*J. Nat. Prod.* 1987, 50, 281).

OTOCHILUS (Orchidaceae)

O. fusca Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 463).

A new steroidal ketone - cyclootochilone - isolated and its structure established (*Tetrahedron* 1985, 41, 4973).

NEW COMPOUNDS

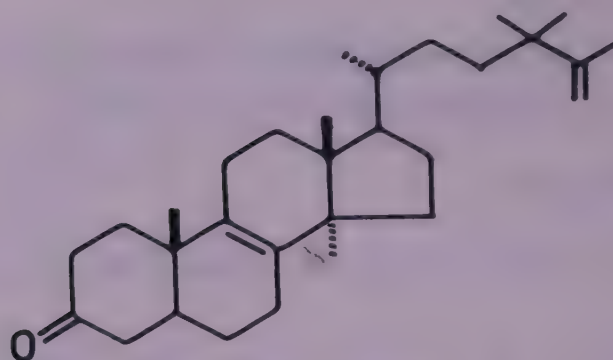


Cyclootochilone

O. lancilabius Seidenf. syn. *O. porecta* sensu Hook.f. (non Lindl.) p.p. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 464).

A new steroidal ketone - otochilone - isolated along with cyclootochilone and its structure determined (*Tetrahedron* 1985, 41, 4973).

NEW COMPOUNDS



Otochilone

O. porecta Lindl.; see *O. lancilabius* Seidenf.

OXYSTELMA (Asclepiadaceae)

O. esculentum (L.f.) R.Br. ex Schult.; see *Sarcostemma secamone* (L.) Bennet

O. secamone (L.) Karst.; see *Sarcostemma secamone* (L.) Bennet

PACHIRA (Bombacaceae)

P. aquatica Aubl.

Seed oil contained C14:0, C16:0, C18:0, C18:1, C18:2 fatty acids, methyl malvalate, methyl sterculate and methyl dihydrosterculate as determined by GC (*An. Assoc. Quim. Argent.* 1985, 73, 225; *Chem. Abstr.* 1985, 103, 138580 r).

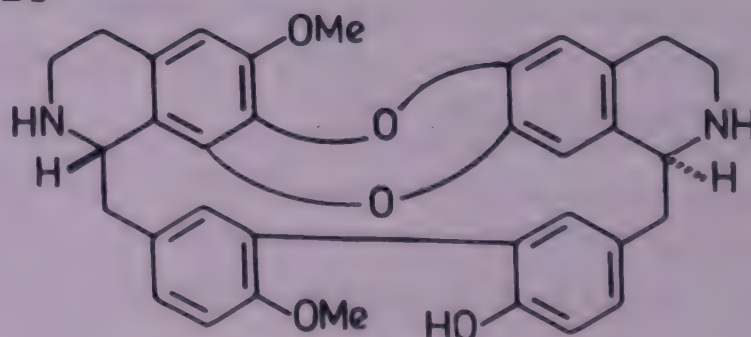
Distribution : Native of tropical America, planted in Calcutta gardens.

PACHYGONE (Menispermaceae)

P. ovata (Poir.) Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 464).

A new bisbenzylisoquinoline alkaloid - pachyovatamine - isolated from leaves and stems along with pachygonamine, N-methylpachygonamine and tiliamosine (*Phytochemistry* 1985, 24, 589).

NEW COMPOUNDS

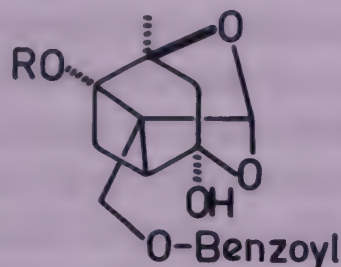


Pachyovatamine

PAEONIA (Ranunculaceae)

P. officinalis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 184).

A monoterpene glycoside - paeoniflorin - and its galloyl derivative isolated from roots and characterised (*Saengyak Hakhoechi* 1989, 20, 48; *Chem. Abstr.* 1989, 111, 160062 k).

NEW COMPOUNDS**Paeoniflorin**

R = Glu

Galloylpaeoniflorin

R = Glu(6'-galloyl)

PALIURUS (Rhamnaceae)

P. spina-christi Mill.

Seeds contained β -sitosterol (66.0), neutral lipids (20.0), campesterol (11.0), stigmasterol (1.3%) and eicosenoic acid (*Khim. Prir. Soedin.* 1985, 322; *Chem. Abstr.* 1985, 103, 102016 x); rutin, isoquercetin and hyperoside identified in fruits (*Khim. Prir. Soedin.* 1986, 639; *Chem. Abstr.* 1987, 106, 64346 g).

Distribution : Himachal Pradesh and Nepal.

PANAX (Araliaceae)

P. bipinnatifidum Seem.; see *P. pseudoginseng* Wall. ssp. *himalaicus* Hara var. *bipinnatifidus* (Seem.) Li

P. ginseng C.A.Mey. syn. *Aralia quinquefolia* Decne. & Planch. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 465).

Aqueous extract exhibited remarkable hypoglycaemic activity in mice (*Planta Med.* 1984, 50, 434).

Ginsenosides Rh1, Rg1, Rg2, Rg3, Rc, Re, Rb1 and Rb2 isolated from stem and leaves of cultivated Chinese plant (*Shenyang Yaoxueyuan Xuebao* 1984, 1, 248; *Chem. Abstr.* 1985, 103, 120059 t; *Zhiwu Xuebao* 1986, 28, 95; *Chem. Abstr.* 1986, 104, 183311 k; *Yaoxue Xuebao* 1986, 21, 356; *Chem. Abstr.* 1986, 105, 57947 e; *Shenyang Yaoxueyuan Xuebao* 1986, 3, 191;

Chem. Abstr. 1987, 106, 2889 c; *Shenyang Yaoxueyuan Xuebao* 1987, 4, 282; *Chem. Abstr.* 1988, 108, 147119 c); ginsenosides Re (6.0), Rb₂ (0.09), Rc (0.08), Rd (0.06), Rb₁ (0.02), Rg₁ (0.02), Rh₁ (0.02) and Rg₂ (0.01%) determined in sarcocarp (*Shenyang Yaoxueyuan Xuebao* 1988, 5, 59; *Chem. Abstr.* 1988, 108, 201778 g); flower buds afforded ginsenosides Rg₂, Re and Rd (*Baichiuen Yike Daxue Xuebao* 1985, 11, 142; *Chem. Abstr.* 1985, 103, 85127 q); ginsenosides Re and Rd (saponins D1 and D2) also isolated from rhizomes (*Zhongyao Tongbao* 1986, 11, 104; *Chem. Abstr.* 1986, 104, 165424 v); isolation of four saponins (I, II, III and IV) from roots (*Jpn.* 6,089,496 (1985) May 20; *Chem. Abstr.* 1986, 104, 34293 d); isolation and characterisation of ginsenoside Rh₃ from leaves along with ginsenoside Rh₂ (*Shenyang Yaoxueyuan Xuebao* 1986, 3, 191; *Chem. Abstr.* 1987, 106, 2889 c; *Shenyang Yaoxueyuan Xuebao* 1987, 4, 282; *Chem. Abstr.* 1988, 108, 147119 c); 20(R)ginsenoside Rh₁, 20(R) ginsenoside Rg₂ and 20(R)protopanaxatriol isolated from Chinese red ginseng (*Yaoxue Xuebao* 1986, 21, 356; *Chem. Abstr.* 1986, 105, 57947 e); separation of ginsenosides Rg₁, Rb₁ and Re from saponin by rotating-disc TLC (*Sepu* 1986, 4, 183; *Chem. Abstr.* 1987, 106, 38306 z); a pectin composed of galactose, galacturonic acid, arabinose and rhamnose isolated (*Yaoxue Xuebao* 1986, 21, 912; *Chem. Abstr.* 1987, 106, 153086 q).

Daucosterin, 20(R)protopanaxatriol, ginsenoside Rh₃ and 20(R)ginsenoside Rh₂ isolated from leaves (*Yaoxue Xuebao* 1987, 22, 685; *Chem. Abstr.* 1988, 108, 43892 h; *Shenyang Yaoxueyuan Xuebao* 1987, 4, 282; *Chem. Abstr.* 1988, 108, 147119 c; *Zhongcaoyao* 1988, 19, 100; *Chem. Abstr.* 1988, 109, 70357 q); 20(R)ginsenoside Rh₂ also isolated from stem (*Yaoxue Xuebao* 1987, 22, 685; *Chem. Abstr.* 1988, 108, 43892 h); isolation of ginsenosides Re, Rg and Rg₂ from leaves of Chinese plant (*Baiqiuen Yike Daxue Xuebao* 1987, 13, 110; *Chem. Abstr.* 1989, 111, 83953 x); flower buds afforded ginsenosides Ro, Rb₁, Rg₁ and Rf (*Baiqiuen Yike Daxue Xuebao* 1987, 13, 399; *Chem. Abstr.* 1988, 108, 183680 n); ginsenosides Rb₂, Rd and Re present in stem (*Zhongyao Tongbao* 1987, 12, 164; *Chem. Abstr.* 1987, 107, 55750 c); isolation of ginsenosides Rf, Rf₁, Rg₂ and F₁ from stems and identification by ¹³C-NMR (*Zhongyao Tongbao* 1987, 12, 480; *Chem. Abstr.* 1987, 107, 205018 m); a novel saponin - ginsenoside La - isolated from leaves and characterised by 2D-NMR (*Chem. Pharm. Bull.* 1989, 37, 1966); saponins GF-II and GF-III from fruits of 5 year old plant, identified as ginsenosides Rb₂ and Rc respectively (*Jilin Daxue Ziran Kexue Xuebao* 1987, 117; *Chem. Abstr.* 1987, 107, 130921 q); ginsenosides Rb₁, Rd₁ and Re from fruits (*Kexue Tongbao* 1988, 33, 379; *Chem. Abstr.* 1988, 109, 70393 y); isolation and structure elucidation of two isomeric saponins - GF-VI and GF-VII - from fruits (*Kexue Tongbao* 1987, 32, 536; *Chem. Abstr.* 1987, 107, 233052 m); isolation of ginsenosides Rh₁ and Rg₂ from whole plant (*Han'guk Nonghwa Hakhoechi* 1989, 32, 137; *Chem. Abstr.* 1989, 111, 187201 s).

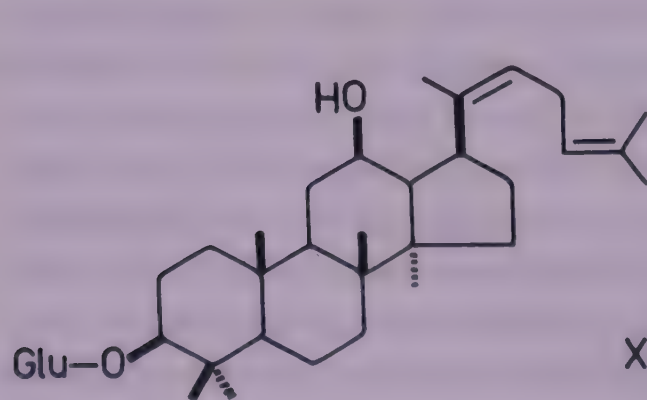
A hypoglycaemic glycan - panaxan A - isolated from roots and partially characterised (*Planta Med.* 1984, 50, 434, 436); panaxans B, C, D and E also isolated from roots (*Planta Med.* 1984, 50, 434); structure determination of panaxan B (*Phytochemistry* 1985, 24, 2431);

panaxans F, G and H isolated from roots of Korean plant (*Shoyakugaku Zasshi* 1985, 39, 331; *Chem. Abstr.* 1986, 104, 230304 x); isolation of new glycans - panaxans I, J, K and L - from roots of Korean plant (*J. Ethnopharmacol.* 1985, 14, 255; *Chem. Abstr.* 1986, 104, 155782 w); isolation of a pectin constituted of two acidic polysaccharides SA and SB, containing galactose, arabinose and rhamnose in molar ratios of 4.7:2.6:1.0 and 3.3:1.8:1.0 respectively (*Yaoxue Xuebao* 1984, 19, 764; *Chem. Abstr.* 1985, 102, 50765 y); a new glucoside - 2-oxopropyl- α -D-glucopyranoside - isolated from red ginseng root together with a mixture of unstable epimeric glycosides which readily decomposed to give maltol; new compound characterised (*Chem. Pharm. Bull.* 1984, 32, 4674); isolation and structure determination of a new compound - 3-sec.butyl-2-methoxy-5-methylpyrazine - from roots; 3-isopropyl-2-methoxy-5-methylpyrazine, 2-isopropyl-3-methoxypyrazine and 2-sec.butyl-3-methoxypyrazine also isolated (*Yakugaku Zasshi* 1984, 104, 951; *Chem. Abstr.* 1985, 102, 50758 y); identification of alloaromadendrene, aromadendrene, β -bisabolene, cis- and trans-caryophyllenes, 2,5-dimethyltridecane, γ -elemene, eremophilene, β -eudesmol, trans- β -farnesene, β -guaiene, β -gurjunene, mayurone, ϵ -muurolene, γ -patchoulene, n-pentadecane and palmitic acid in oil (*Kexue Tongbao* 1985, 30, 195; *Chem. Abstr.* 1985, 103, 51202 v) β -elemene, alloaromadendrene and β -patchoulene identified in essential oil from roots (*Baiqiuen Yike Daxue Xuebao* 1985, 11, 377; *Chem. Abstr.* 1986, 105, 213925 d); a new flavonoid - panasenoside - isolated from leaves and stems of Chinese plant and characterised; kaempferol and trifolin also isolated (*Shenyang Yaoxueyuan Xuebao* 1985, 2, 284; *Chem. Abstr.* 1986, 104, 85413 a).

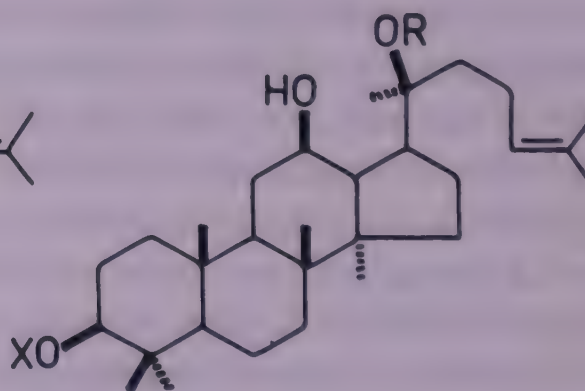
Isolation of a new compound - 2-methyl-4-pyrone-3-O- β -D-glucoside - from Chinese red ginseng and its characterisation (*Yaoxue Xuebao* 1986, 21, 71; *Chem. Abstr.* 1986, 104, 221976 r); N9-formylharman, ethyl β -carboline-1-carboxylate and perlolyrine from roots (*Arch. Pharmacol Res.* 1986, 9, 21; *Chem. Abstr.* 1986, 105, 57927 y); crystal structures of panaxadiol and panaxatriol confirmed (*Acta Crystallogr. Cryst. Struct. Commun.* 1986, 42C, 576; *Chem. Abstr.* 1987, 106, 176691 x); new polyacetylenic compound - heptadeca-1,8-dien-4,6-diyn-3,10-diol - isolated from Korean ginseng root and characterised (*Phytochemistry* 1987, 26, 2849; *Bull. Korean Chem. Soc.* 1987, 8, 272; *Chem. Abstr.* 1988, 108, 128437 p; *Planta Med.* 1988, 54, 183); in addition, heptadeca-1,4-dien-6,8-diyn-3,10-diol isolated from roots and characterised by HPLC (*Bull. Korean Chem. Soc.* 1987, 8, 272; *Chem. Abstr.* 1988, 108, 128437 p); two new polyacetylenes - panaxacol and dihydropanaxacol - isolated from callus and their structures determined (*Phytochemistry* 1987, 26, 2850); new cytotoxic compound - chloropanaxdiol - isolated together with panaxydol from callus and its structure elucidated (*Chem. Pharm. Bull.* 1988, 36, 4206); new polyynes - panaxyne - isolated from Korean plant and characterised as tetradeca-13-ene-1,3-diyn-6,7-diol (*Saengyak Hakhoechi* 1989, 20, 71; *Chem. Abstr.* 1989, 111, 224891 q); two more new polyynes - acetoxypanaxdiol and panaxydolchlorohydrin - isolated from Korean plant (*Arch. Pharm.* 1989, 322, 223; *Chem. Abstr.* 1989, 111, 54181 p); another polyacetylene - 10-acetylpanaxytriol - isolated from roots of Korean plant and characterised

as heptadeca-1-ene-4,6-diyne-3,9-diol-10-acetate (Yakhak Hoechi 1989, 33, 118; *Chem. Abstr.* 1989, 111, 146363 c); Two new sesquiterpene alcohols - panasinsanols A and B - isolated from roots together with α -, β -panasinsenes and α -, β -neoclovenes; structures of new compounds determined (*Chem. Pharm. Bull.* 1987, 35, 1975); isolation of another sesquiterpene alcohol - ginsenol - from rootlets and its characterisation (*Chem. Pharm. Bull.* 1988, 36, 2447); isolation of spinacine from roots and its structure determination (*Arch. Pharmacol Res.* 1987, 10, 258; *Chem. Abstr.* 1988, 108, 201742 r); isolation of (+)-spathulenol, (-)-4 β ,10 α -aromadendranediol and (-)-neointermedeol (*Chem. Pharm. Bull.* 1989, 37, 509); nonacosane tripalmitin, panaxynol, linolein, palmitic acid, β -sitosterol and α -, γ -dipalmitins from fresh roots (*Shenyang Yaoxueyuan Xuebao* 1988, 5, 16; *Chem. Abstr.* 1988, 109, 3834 e); isolation of 4-methyl-5-ethanolthiazole, harman and norharman (*Arch. Pharmacol Res.* 1988, 11, 52; *Chem. Abstr.* 1988, 109, 35272 m); isolation of an insulin-like substance and its identification as pyroglutamic acid (*Wakan Iyaku Gakkaishi* 1988, 5, 544; *Chem. Abstr.* 1989, 111, 63806 y); four anti-complementary acidic heteroglycans - GL-PI, GL-PII, GL-PIII and GL-PIV - isolated from leaves and characterised (*Carbohydr. Res.* 1988, 181, 175; *Chem. Abstr.* 1988, 109, 167355 a); fractionation of water-soluble acidic heteroglycan fraction from stem yielded five fractions S-1, S-2, S-3, SA and SC; main chain of S-1 composed of (1 \rightarrow 3)-linked galactose residues (*Shengwu Huaxue Yu Shengwu Wuli Xuebao* 1988, 20, 119; *Chem. Abstr.* 1988, 109, 187379 q); salicylic, p-coumaric, gentisic and caffeic acids isolated (*Han'guk Nonghwa Hak-hoechi* 1989, 32, 50; *Chem. Abstr.* 1989, 111, 112321 x).

NEW COMPOUNDS



Ginsenoside Rh3



X = Glu(2 \rightarrow 1)Glu(6''-malonoyl)

I

R = Glu(6 \rightarrow 1)Glu

II

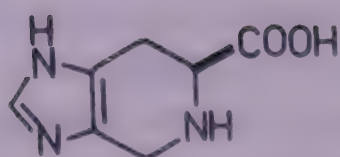
R = Glu(6 \rightarrow 1)Ara(pyranosyl)

III

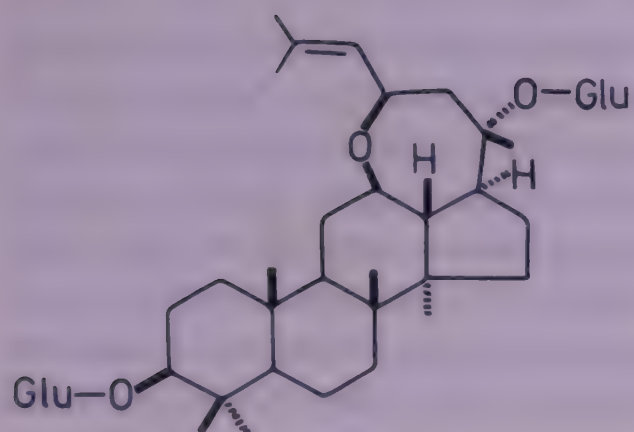
R = Glu(6 \rightarrow 1)Ara(furanosyl)

IV

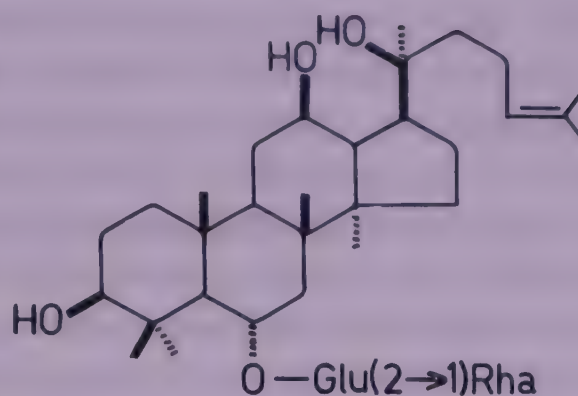
R = Glu



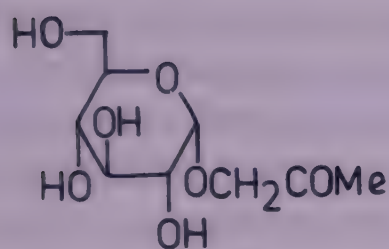
Spinacine



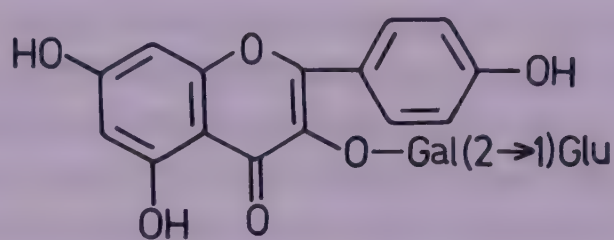
Ginsenoside La



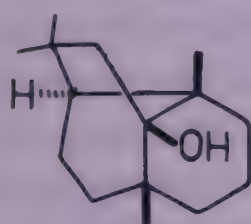
GF-VI



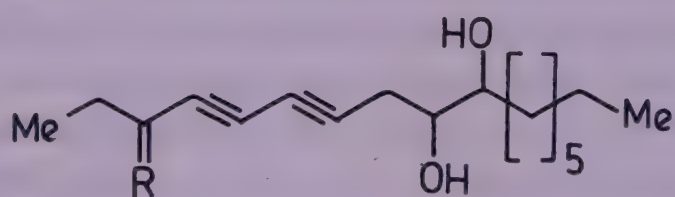
2-Oxopropyl-α-D-glucopyranoside



Panasenoside



Ginsenol

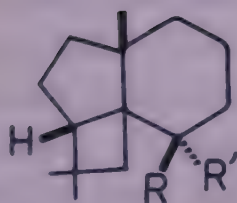


Panaxacol

R = O

Dihydropanaxacol

R = H, OH

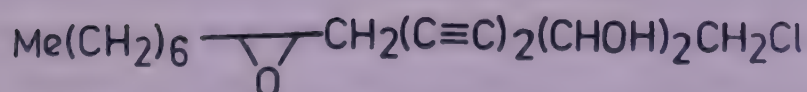


Panasinsanol A

R = Me, R' = OH

Panasinsanol B

R = OH, R' = Me



Chloropanaxydiol

BIOLOGICAL ACTIVITY

Ginsenoside Rh2 incorporated into cell membranes in B16 melanoma and human red blood cell culture; fluidity of cell membranes was modified (*Wakan Iyaku Gakkaishi* 1985, 2, 532; *Chem. Abstr.* 1986, 105, 54208 d); ginsenoside Rh2 (5.0-15.0 μ M) inhibited growth of B16 melanoma cells in concentration-dependent manner, inhibited mouse melanoma cultured B16 cells and stimulated melanogenesis (*Wakan Iyaku Gakkaishi* 1985, 2, 170; *Chem. Abstr.* 1986, 104, 28514 k; *Kanazawa Ika Daigaku Zasshi* 1985, 10, 189; *Chem. Abstr.* 1986, 104, 81632 y); ginsenoside Rh1 was inactive against mouse B16 melanoma cultured cells but stimulated the expression of melanotic phenotype (*Kanazawa Ika Daigaku Zasshi* 1985, 10, 189; *Chem. Abstr.* 1986, 104, 81632 y); 20(R)ginsenoside Rh2 inhibited growth of human leukaemia cell line HL-60 (*Zhongcaoyao* 1988, 19, 100; *Chem. Abstr.* 1988, 109, 70357 q); ginsenosides Rh1 and Rg2 showed anticancer activity in rats (*Han'guk Nonghwa Hakhoechi* 1989, 32, 137; *Chem. Abstr.* 1989, 111, 187201 s); 20(S) and 20(R)ginsenosides Rh1 stimulated melanin synthesis in a concentration-dependent manner; melanogenesis was also stimulated by ginsenoside Rg3 (*Wakan Iyaku Gakkaishi* 1985, 2, 170; *Chem. Abstr.* 1986, 104, 28514 k); 20(R)ginsenoside Rh2 (2.0 μ g/ml) inhibited growth of human leukaemia cell line HL-60 (*Zhongcaoyao* 1988, 19, 100; *Chem. Abstr.* 1988, 109, 70357 q); panaxacol and dihydropanaxacol inhibited Yoshida sarcoma cells in tissue culture (*Phytochemistry* 1987, 26, 2850); chloropanaxydiol exhibited cytotoxic effect against L1210 cells in tissue culture (*Chem. Pharm. Bull.* 1988, 36, 4206); 1,8-trans-heptadecadiene-4,6-diyne-3,10-diol inhibited growth of L1210 cells, ED50 0.3 μ g/ml (*Planta Med.* 1988, 54, 183); panaxyne (ED50 11.0 μ g/ml) showed cytotoxic effect against L1210 cells (*Saengyak Hakhoechi* 1989, 20, 71; *Chem. Abstr.* 1989, 111, 224891 q); acetoxypanaxydol (ED50 0.52 μ g/ml) and panaxydol chlorohydrin exhibited cytotoxic activity against L1210 cells (*Arch. Pharm.* 1989, 322, 223; *Chem. Abstr.* 1989, 111, 54181 p); 10-acetylpanaxytriol exhibited cytotoxic activity against L1210 cells, ED50 1.2 μ g/ml; it was less cytotoxic than panaxytriol and panaxydol (*Yakhak Hoechi* 1989, 33, 118; *Chem. Abstr.* 1989, 111, 146363 c); oral administration of ginseng polysaccharides increased survival time of mice inoculated with S180 or Ehrlich tumor cells, but were inactive against Ehrlich tumor cells *in vitro*. In tumor-bearing mice immunised with sheep red cells, polysaccharides (0.4-0.8 mg/kg/day, orally for 10 days) increased the number of plaque-forming and specific rosette-forming cells and antibody formation by spleen cells (*Zhongguo Yaoli Xuebao* 1987, 8, 277; *Chem. Abstr.* 1987, 107, 17404 k).

Panaxans A, B, C, D and E exhibited significant hypoglycaemic activity in normal and alloxan-induced hyperglycaemic mice (*Planta Med.* 1984, 50, 434); panaxans A and B also showed hypoglycaemic activity in spontaneously diabetic mice; panaxan A did not affect plasma insulin levels and insulin sensitivity but panaxan B elevated plasma insulin level and enhanced insulin sensitivity *in vivo* (*Phytother. Res.* 1989, 3, 20; *Chem. Abstr.* 1989, 111, 528 p); panaxan A affected activities of hepatic glucokinase and hexokinase but decreased glucose-6-phosphatase activity. Panaxan B reduced hepatic glycogen synthetase activity and lowered

glycogen content in liver. Both panaxans A and B increased phosphorylase activity as well as glucose-6-phosphate dehydrogenase and phosphofructokinase activities in liver (*Phytother. Res.* 1989, 3, 15; *Chem. Abstr.* 1989, 111, 527 n); panaxans F, G and H on i.p. injection in normal and alloxan-induced hyperglycaemic mice showed hypoglycaemic activity in the order panaxans H > F > G (*Shoyakugaku Zasshi* 1985, 39, 331; *Chem. Abstr.* 1986, 104, 230304 x); panaxans I, J, K and L on i.p. administration in normal mice, showed dose-dependent hypoglycaemic activity (*J. Ethnopharmacol.* 1985, 14, 255; *Chem. Abstr.* 1986, 104, 155782 w); ginsenoside Rb2 (2.0 mg/ml, i.p.) administered to rats lowered blood sugar level (*Jpn.* 24,597 (1986) Feb. 03; *Chem. Abstr.* 1986, 105, 146237 r); it also decreased triglyceride, non-esterified fatty acids and total cholesterol levels in serum of streptozotocin-diabetic rats. Lipid-improving action in serum was observed and lipolytic activity of lipoprotein lipase was stimulated with concomitant decrease in level of triglyceride. In addition to this, ginsenoside Rb2 lowered serum levels of 3-hydroxybutyrate and acetoacetate in rats indicating improvement of diabetic ketoacidosis (*Chem. Pharm. Bull.* 1985, 33, 3893); administration of ginsenoside Rb2 (10.0 mg/day, i.p. for six days) markedly decreased blood urea N level in streptozotocin-diabetic rats. An increase was observed in total protein, lysine, glycine, glutamic acid and arginine in serum with no significant change in serum albumin. Furthermore, body weight increased significantly in diabetic rats receiving ginsenoside Rb2 even though they took less food than the control group (*Chem. Pharm. Bull.* 1987, 35, 4208); administration of total extract and saponins of Chinese and Korean red ginseng to rats (i.p. route) showed lowering of hepatic glycogen but hepatic glucose was unaffected. Similar results obtained in adrenalectomised mice and rats (*Shenyang Yaoxueyuan Xuebao* 1988, 5, 114; *Chem. Abstr.* 1988, 109, 104756 m).

20(S) and 20(R)ginsenosides Rg3 inhibited collagen- and ADP- induced rat platelet aggregation *in vitro*. 20(S)ginsenoside Rg3, and 20(S) and 20(R) ginsenosides Rh1 inhibited thrombin-induced conversion of fibrinogen to fibrin *in vitro* (*Shoyakugaku Zasshi* 1985, 39, 123; *Chem. Abstr.* 1986, 104, 14760 a); ginsenoside Rg2 (1.0 mM) strongly inhibited rat platelet aggregation induced by endotoxin, collagen and arachidonic acid. Ginsenosides Ro, Rb1, Rb2, Rc, Rg1 and Rg2 possibly promote action of urokinase in fibrinolytic system (*Chem. Pharm. Bull.* 1986, 34, 1153); effect of ginseng saponins on aggregation and 5-hydroxytryptamine (5-HT) release in human platelets investigated; of the six saponins tested, only ginsenosides Rg1 (5.0-500.0 µg/ml) inhibited dose-dependently adrenaline and thrombin-induced platelet aggregation and 5-HT release (*J. Pharm. Pharmacol.* 1988, 40, 838); influence of saponins on neurotransmitter uptake in rat brain synaptosomes studied. Total ginsenoside fraction inhibited uptake of radioactive GABA, glutamate, dopamine, noradrenaline and 5-HT but not that of 2-deoxy-D-glucose and leucine. Ginsenoside Rd was the most effective in reducing uptake of neurotransmitters; similar effect was observed with ginsenoside Rc (*Planta Med.* 1985, 51, 221); ginsenosides Rb1 and Rg1 given i.p. to mice increased radioligand binding to muscarinic receptors and protein synthesis in brain.

However, specific binding of Rb1 or Rg1 to $\alpha 1$, $\alpha 2$ and β -adrenergic and dopamine receptors of brain not observed (Yaoxue Xuebao 1988, 23, 12; Chem. Abstr. 1988, 108, 216194 n); ginsenoside from stems and leaves activated phagocytic function of reticuloendothelial system in mouse blood, thus enhancing nonspecific resistance to infection and shock (Zhongcaoyao 1985, 16, 220; Chem. Abstr. 1985, 103, 115889 j); polysaccharides from root given orally or i.p. (100.0-200.0 mg/kg for 5-8 days) were effective against cyclophosphamide-induced immunodeficiency in mice; suppression of macrophage phagocytosis and hemolysin formation and delayed hypersensitivity reaction were normalized (Shenyang Yaoxueyuan Xuebao 1986, 3, 162; Chem. Abstr. 1986, 105, 183616 j).

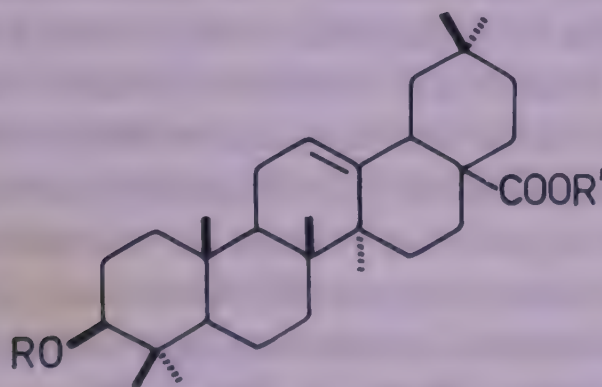
20(S)Ginsenoside Rh2, 20(R)ginsenoside Rg3, 20(R) and 20(S)ginsenosides Rs and prosapogenin of ginsenoside Ro prevented carbon tetrachloride-induced cytotoxicity in primary cultured rat hepatocytes. 20(S)Ginsenoside Rh1 and prosapogenin of 20(S)ginsenoside Rs inhibited galactosamine- induced liver cell damage (Planta Med. 1985, 51, 62); crude ginseng saponins, ginsenosides Rb1 and Rg1 were evaluated for their effects on agonistic behaviour in mice using resident- intruder test situation. When resident mouse was treated with crude saponin (25.0-100.0 mg/kg, i.p.) or ginsenoside Rb1 (2.5-10.0 mg/kg, i.p.) aggressive episodes (offensive sideways posture and attack bite) were significantly suppressed in a dose-dependent manner, whereas ginsenoside Rg1 was ineffective. Neither ginsenosides Rb1 nor Rg1 given to intruder caused any significant changes in the behaviour of the resident (Eur. J. Pharmacol. 1988, 146, 291); acute and chronic effects of crude saponin, ginsenosides Rb1 and Rg1 on maternal aggression were studied in mice. Acute i.p. administration of saponin (50.0 and 100.0 mg/kg) or ginsenoside Rb1 (2.5 and 5.0 mg/kg) suppressed maternal aggression in a dose-dependent manner, whereas ginsenoside Rg1 was ineffective. Chronic treatment with saponin (50.0 mg/kg) or ginsenoside Rb1 (2.5 mg/kg) also suppressed maternal aggression without causing motor dysfunction. Thus, ginseng root contains a psychoactive ingredient, ginsenoside Rb1, which suppresses maternal aggression (Eur. J. Pharmacol. 1988, 150, 319); panaxadiol saponins and panaxatriol saponins inhibited Na^+ and K^+ -ATPases in rabbit brain striatum microsomes in concentration-dependent manner. Panaxadiol saponins at 10.0 μM stimulated and at 1.0 mM inhibited Ca^{2+} -ATPase in these microsomes (Yaoxue-Xuebao 1988, 23, 494; Chem. Abstr. 1988, 109, 163412 u); ginsenosides Rb1, Rb2, Rg1 and Re inhibited development of morphine-induced tolerance in mice; loss in body weight induced by multiple injections of morphine, was prevented by these ginsenosides (Saengyak Hakhoechi 1989, 20, 123; Chem. Abstr. 1989, 111, 187328 p); root saponins decreased reduction in body temperature and ECG activity caused by exposure of rats to a hypobaric, hypoxic environment; they also protected mitochondria and tissues of brain and heart from damage and prolonged survival time (Zhongyao Yaoli Xuebao 1988, 9, 391; Chem. Abstr. 1988, 109, 163489 z).

In dogs, i.v. injection of total flavonoids from stems and leaves decreased left ventricular pressure, heart rate, blood pressure, total peripheral resistance and oxygen consumption (*Shenyang Yaoxueyuan Xuebao* 1986, 3, 166; *Chem. Abstr.* 1986, 105, 202955 n); total flavones from stems and leaves inhibited hypoxia under normal or reduced atmospheric pressure or induced by isoprenaline and myocardial ischemia induced by vasopressin. Flavones also increased coronary blood flow in isolated guinea pig heart (*Zhongcaoyao* 1988, 19, 549; *Chem. Abstr.* 1989, 110, 165826 b).

P. pseudoginseng Wall. ssp. *himalaicus* Hara (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 509).

Six new saponins - pseudoginsenosides - RP1, RT1, RT2, RT3, RT4 and RT5 - isolated from rhizomes of plant grown at high altitude (3100 m) in Bhutan and characterised; known chikusetsusaponins IVa and V, ginsenosides Rg1, Rd, Rb1 and pseudoginsenoside F11 also isolated; rhizomes of plant collected at altitude of 2600-3500 m afforded ginsenosides F2, Rg1, Re, Rd, Rb1, pseudoginsenosides RT1, RT3, RT4 and RP1, gypenoside XVII, chikusetsusaponins IVa and V and its prosapogenin (*Chem. Pharm. Bull.* 1985, 33, 2323); hydrolysis of crude saponins from rhizomes afforded oleanolic acid, β -sitosterol, panaxadiol and panaxatriol (*Indian J. Pharm. Sci.* 1987, 49, 140); isolation of ginsenosides Rb1, Rb2, Rb3, Rc, Rd, Re, Rg1, Ro and pseudoginsenosides F11, RP1, RT1, chikusetsusaponins IV and IVa (*Planta Med.* 1989, 55, 396); pentatriacontane, dotriacontanyl palmitate and triacontanoic, palmitic, stearic and oleanolic acids, β -sitosterol and its glucoside, 14-hydroxyheneicosanoic acid, 24-hydroxyhexatetracontanoic acid and 2-methylhexatetracont-1-en-3,21-diol isolated from rhizomes (*Fitoterapia* 1989, 60, 283); isolation and characterisation of a new compound - bis(2-ethylheptyl)phthalate; hentriacontane, hexadecyl palmitate, dotriacontanyl palmitate, dotriacontanol, dotriacontanoic acid, oleanolic acid and β -sitosterol also isolated (*Indian J. Pharm. Sci.* 1989, 51, 209).

NEW COMPOUNDS

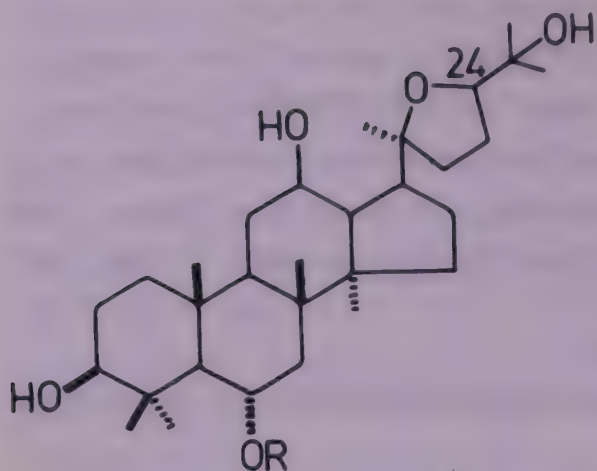


Pseudoginsenoside RP1

R = Gluc.acid(2→1)Xyl, R' = H

Pseudoginsenoside RT1

R = Gluc.acid(2→1)Xyl, R' = Glu



Pseudoginsenoside RT2

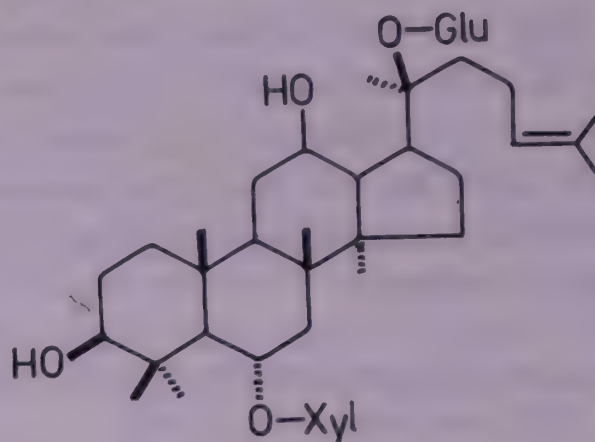
R = Glu(2→1)Xyl (24R)

Pseudoginsenoside RT4

R = Glu (24S)

Pseudoginsenoside RT5

R = Glu (24R)



Pseudoginsenoside RT3

P. pseudoginseng Wall. ssp. *himalaicus* Hara var. *angustifolius* (Burkill) Li

Adaptogenic and other biological activities of crude extract and saponins of Indian pseudoginseng and saponins of Korean ginseng have been studied in rats and mice. Indian pseudoginseng saponins exhibited better activity than Korean ginseng saponins in several test systems; acute LD₅₀ of crude extract and saponins of Indian pseudoginseng in mice found to be 681.0 and 316.0 mg/kg, i.p., respectively (*Indian J. Exp. Biol.* 1989, 27, 631).

Dotriacontanyl palmitate, methyl palmitate and 14-hydroxyheneicosanoic, palmitic, stearic, eicosanoic, triacontanoic and hexatriacontanoic acids, pentatriacontane, sitosterol and its β -D-glucoside isolated from rhizomes (*Phytochemistry* 1985, 24, 1091); isolation of three new compounds - 24-hydroxyhexatetracontanoic acid, 2-methylhexatetracont-1-en-3,21-diol and tritriacontanyl octacosanoate - from rhizomes together with ginsenosides Ro, Rb1 and chikusetsusaponin IVa (*Phytochemistry* 1986, 25, 2201); hydrolysis of crude saponins from rhizomes yielded oleanolic acid, panaxadiol, panaxatriol and β -sitosterol (*Indian J. Pharm. Sci.* 1987, 49, 140); identification of ginsenosides Rb2, Rb3, Rc, Rd, Ro, Rg1, chikusetsusaponin IV and pseudoginsenosides F11, RP1 and RT1 from rhizomes (*Planta Med.* 1988, 54, 367); a new saponin isolated from rhizomes and characterised as 3-O-[β -D-4-acetylxylopyranosyl(1→2)- β -D-glucuronopyranosyl]-oleanolic acid (*Phytochemistry* 1988, 27, 3012); isolation of hentriacontane, dotriacontanol, dotriacontanoic acid, oleanolic acid and β -sitosterol from leaves (*Indian J. Pharm. Sci.* 1989, 51, 209).

Distribution : Eastern Himalayas, Nepal to Bhutan, alt. 2000-3000 m and Meghalaya and Manipur.

Note : The new binomial proposed for this taxon is *Panax burkillianus* Bennet & Viswanathan [*Indian J. For.* 1984, 110, 1049].

P. pseudoginseng Wall. ssp. *himalaicus* Hara var. *bipinnatifidus* (Seem.) Li syn. *Aralia bipinnatifida* (Seem.) Clarke, *Panax bipinnatifidum* Seem. (*bipinnatifidus*)

Hypoglycaemic peptoglycans - panaxans A, B, C, D and E - isolated (Jpn. 60,172,927 (1985) Sep. 06; *Chem. Abstr.* 1986, 104, 24184 e); hydrolysis of rhizome saponins afforded oleanolic acid, β -sitosterol, panaxadiol and panaxatriol (*Indian J. Pharm. Sci.* 1987, 49, 140); triacontanoic, palmitic, stearic and oleanolic acids, dotriacontanyl palmitate, pentatriacontane, β -sitosterol and its glucoside from rhizomes (*Fitoterapia* 1989, 60, 283); dotriacontanoic, triacontanoic and oleanolic acids, hentriacontane, dotriacontanyl palmitate and β -sitosterol from leaves (*Indian J. Pharm. Sci.* 1989, 51, 209); isolation of ginsenosides Rb1, Rb2, Rb3, Rc, Rd, Re, Rg1 and Ro, chikusetsusaponins IV and IVa, pseudoginsenosides F11, RP1 and RT1 from rhizomes (*Planta Med.* 1989, 55, 396).

Distribution : Nepal to Assam.

P. pseudoginseng Wall. ssp. *pseudoginseng* syn. *Aralia pseudoginseng* (Wall.) Benth. ex Clarke, p.p. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 508).

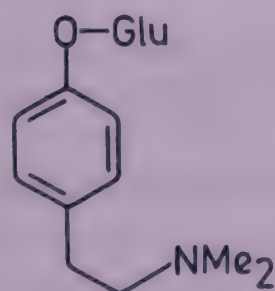
Hypoglycaemic peptidoglycans - panaxans A, B, C, D and E - isolated (Jpn. 60,172,927 (1985) Sep. 06; *Chem. Abstr.* 1986, 104, 24184 e); chikusetsusaponin IV (0.15), pseudoginsenoside RT1 (0.04) and ginsenoside Rg1 isolated from rhizomes of plant collected from Nialamu, Tibet; oleanolic acid-3-O- α -L-arabinofuranosyl(1 \rightarrow 4)- β -D-glucuronide also isolated (*Chem. Pharm. Bull.* 1986, 34, 4833).

PANCRATIUM (Amaryllidaceae)

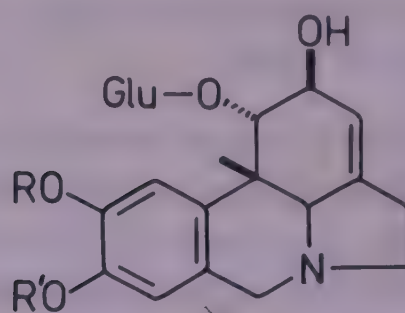
P. biflorum Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 469).

New glucosyloxy alkaloids - hordenine-4-O- β -D-glucoside, lycorine-1-O- β -D-glucoside and pseudolycorine-1-O- β -D-glucoside - isolated from flowers, stems and roots along with β -phenethylamine, tyramine, hordenine, lycorine, pseudolycorine, pretazettine and tazettine; structures of new compounds elucidated (*Phytochemistry* 1984, 23, 1167).

NEW COMPOUNDS



Hordenine-4-O-glucoside



Lycorine-1-O-glucoside

RR' = -CH₂-

Pseudolycorine-1-O-glucoside

R = H, R' = Me

PANDANUS (Pandaceae)

P. fascicularis Lamk. syn. *P. odoratissimus* Roxb., *P. tectorius* auct. (non Soland. ex Parkinson) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 184).

Physcion, cirsilineol, n-triacontanol, β -sitosteol, stigmasterol, campesterol, daucosterol and palmitic and stearic acids isolated from rhizomes (*Zhongcaoyao* 1987, 18, 391; *Chem. Abstr.* 1988, 108, 19234 z).

P. odoratissimus Roxb.; see *P. fascicularis* Lamk.

P. tectorius Soland. ex Parkinson; see *P. fascicularis* Lamk.

PAPAYER (Papaveraceae)

P. argemone L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 185).

Magnoflorine, protopine, isocorydine, scoulerine, corytuberine and its quaternary N-methyl derivative, allocryptopine, cryptopine, coptisine, rhoeadine, papaverrubines C, D and E and alkaloids PAR1, PAR2, PAR3 isolated (*Collect. Czech. Chem. Commun.* 1988, 53, 1845).

P. orientale L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 470).

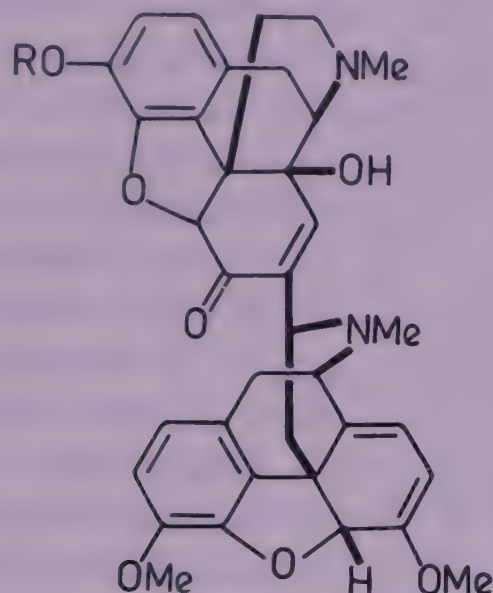
Isolation of isothebaine, salutaridine, orientalidine, mecambridine and alborine from latex (*Ankara Univ. Eczacilik Fak. Derg.* 1985, 15, 1; *Chem. Abstr.* 1987, 106, 210992 h).

P. somniferum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 471).

Triglyceride esters from seeds exhibited antitumor activity against Ehrlich ascites carcinoma in mice (Jpn. 6,242,927 (1987) Feb. 24; *Chem. Abstr.* 1987, 106, 182634 x).

Synthesis of (S)(+)laudanosine (*Can. J. Chem.* 1986, 64, 2205); two new dimeric alkaloids - somniferine and its methyl ether - isolated from plant grown in Tasmania and their structures and absolute stereochemistry determined (*Tetrahedron Lett.* 1988, 29, 3115).

NEW COMPOUNDS



Somniferine

R = H

Somniferine O-methyl ether

R = Me

BIOLOGICAL ACTIVITY

Papaverine inhibited uptake of ^{14}C -labelled adenosine by thymocytes in concentration-dependent manner (*Farmakol. Toksikol.* 1986, 49, 59; *Chem. Abstr.* 1986, 104, 81795 d); papaverine not only decreased speed of accumulation of Ca^{2+} in isolated mitochondria from rat myocardium but also inhibited Ca^{2+} -stimulated mitochondrial respiration; it also increased stability of mitochondria to harmful effects of calcium ions (*Krovoobrashchenie* 1987, 20, 9; *Chem. Abstr.* 1987, 107, 168549 n); papaverine administration produced significant increase in acetylcholinesterase activity in cerebral cortex and striatum of rat brain (*Arch. Pharmacol. Res.* 1989, 12, 34; *Chem. Abstr.* 1989, 111, 50331 q); papaverine (10.0-80.9 $\mu\text{g/ml}$) suppressed contractile activity of rat heart papillary muscle. It exerted cardiostimulating effect on atrial auricula; in both cases papaverine smoothed rhythmoinotropic activity (*Farmakol. Toksikol.* 1987, 50, 43; *Chem. Abstr.* 1987, 107, 33109 y).

Inhibition of carrageenin-induced oedema by morphine observed 120 min after carrageenin injection, suggesting that inhibition of kinin formation phase might be partly responsible for its anti-inflammatory activity. Zymosan-stimulated chemoluminescence of neutrophils of

rats was inhibited both by morphine (0.1-1.0 μ M) and naloxone (1.0-100.0 μ M) (*J. Pharm. Pharmacol.* 1985, 37, 100); administration of morphine, i.p., for 24 days in female rats blocked estrous cycle in metestrus, decreased number of evolutive follicles as well as functioning corpora lutea and increased follicle atresia (*Arch. Ital. Anat. Embriol.* 1987, 91, 189; *Chem. Abstr.* 1987, 107, 190762 y); local intestinal component of constipating action of morphine was assessed through several integrated approaches in rat. The doses of systemically administered morphine reducing small intestinal transit of charcoal meal fed by gavage to overnight fasted rats to 50.0% of drug-free controls, were 0.04 and 3.8 mg/kg, i.p. and p.o. and 0.5 mg/kg either s.c. or i.v. respectively. Transit inhibition with any of these doses of morphine occurred within 10 min and lasted upto 4 hr. Morphine did not reduce significantly gastro-intestinal transit in rats receiving naloxone (i.p., 1.0 mg/kg, 5 min before morphine); studies showed that morphine administered through systemic route delays transit of meal along small intestine virtually through local activation of opioid-specific sites in gut (*J. Pharmacol. Exp. Therap.* 1986, 237, 945); administration of morphine (0.2 mg/kg/day, s.c. for 10 days) inhibited antitumor activity of cyclophosphamide against sarcoma 180 in male mice. It decreased footpad oedema and response of plaque-forming cells of sheep red blood cells (*Annu. Rep. Tohoku Coll. Pharm.* 1986, 263; *Chem. Abstr.* 1987, 107, 168272 s); morphine (0.1 mg/kg, i.v.) prolonged micturition interval and increased the level of micturition threshold in anaesthetised rats. Morphine (1.0 mg/kg, i.v.) completely inhibited bladder contraction and bladder pressure was elevated until fluid leaked from penis, but bladder pressure after inhibition by morphine (1.0 and 5.0 mg/kg, i.v.) did not significantly rise above peak pressure level during micturition before injection of morphine. Inhibitory effect of morphine was reversed by naloxone (0.1 mg/kg, i.v.). These results indicated that urinary retension induced by morphine resulted from inhibition of bladder function mediated via opioid receptors of micturition centres in supraspinal and spinal regions (*Jap. J. Pharmacol.* 1988, 48, 31); effects of morphine on two selected parameters of visual function in rabbits determined. The amplitudes of a- and b- waves were increased in a dose-dependent manner under influence of morphine; electroretinogram (ERG) pattern was distorted by morphine (*Indian J. Pharmacol.* 1988, 20, 114).

Injection of morphine (10.0 μ g/ml) into anterior part of rat caudate nucleus inhibited nociceptive responses of nucleus raphe magnus (NRM) neurons for 2-30 min. In addition, morphine inhibited firing of majority of NRM neurons after injection into anterior part of caudate nucleus (*Zhongguo Yaoli Xuebao* 1984, 5, 228; *Chem. Abstr.* 1985, 102, 72795 k); analgesic effect of morphine on spinal nociceptive transmission compared in rabbit with intact and cold-blocked states of spinal cord. Morphine (2.0 mg/kg) showed greater suppressive effect on nociceptive responses than on spontaneous activity responses and degree of suppressive effect on bradykinin-induced activity was significantly greater in intact state than in cold-blocked state; it (4.0 mg/kg) suppressed nociceptive responses to similar levels in both states. Thus, in small doses indirect suppressive action was more important for production of

analgesia than direct suppressive action at spinal level; in larger doses, direct suppressive action became predominant (*Jap. J. Pharmacol.* 1985, 39, 112); morphine (1.32-13.2 μ M) attenuated in concentration-dependent manner cholinergic nerve activity in human isolated sigmoid taenia coli muscle strip (*Brit. J. Pharmacol.* 1986, 88, 307); morphine (2.5-5.0 mg/kg, s.c. or 2.5-5.0 μ g i.c.v.) inhibited defecation reflex in mice (*Zhongguo Yaoli Xuebao* 1986, 7, 31; *Chem. Abstr.* 1986, 104, 102347 b).

Administration of morphine to fetal sheep produced a biphasic change in breathing, with initial apnea followed by hyperpnea; during hyperpnea there was increase in respiratory output and frequency (*Physiol. Dev. Fetus Newborn* 1985, 643; *Chem. Abstr.* 1986, 104, 14855 k); in rabbits naive to opiates or pretreated with morphine (5.0 mg/kg) for five days, a selective morphine-induced facilitation of inspiratory-inhibitory vagal reflex was observed (*Experientia* 1985, 41, 458); systematic analysis of morphine effects on ventilation and its components tidal volume and frequency in intact, awake and unstrained rats, was measured while animals breathed air or various concentration of CO₂ in air. The experiments support the hypothesis that opiates depress ventilatory responses to CO₂, but several experimental conditions were identified in which opiate action on minute volume was affected by intricate or perhaps paradoxical effects on tidal volume and frequency (*J. Pharmacol. Exp. Therap.* 1986, 237, 252).

Effect of acute morphine treatment on plasma immunoreactive atrial natriuretic factor (IR-ANF) studied in conscious non-hydrated rats. Morphine treatment induced 8-fold increase in plasma IR-ANF ($P < 0.001$) and this increase was completely abolished by pretreatment with naloxone. Morphine-induced increase of plasma IR-ANF may provide a rational basis for explaining diuretic effect of morphine in conscious non-hydrated rats (*Eur. J. Pharmacol.* 1986, 131, 91); influence of morphine on gastric acid secretion stimulated by 2-deoxy-D-glucose or electrical vagal stimulation was studied in anaesthetised rats with perfused stomachs. Changes in gastric acid output induced by electrical vagal stimulation not noticeably affected, whereas those evoked by 2-deoxy-D-glucose were significantly suppressed by morphine pretreatment. This depressant effect was abolished by naloxone pretreatment. It is suggested that morphine inhibits vagal-stimulated gastric acid secretion in rats, by acting predominantly on opioid receptors in central nervous system (*Eur. J. Pharmacol.* 1987, 139, 251); pretreatment of rabbits with morphine (10.0 mg/kg, i.v. or 0.2 mg/kg, i.c.v.) completely blocked thyrotropin releasing hormone (TRH)-induced colonic transit and increase in luminal fluid as well as hyperserotonemia, when TRH (10.0 μ g) administered i.c.v. to anaesthetised rabbits; these results suggested that morphine inhibited TRH-induced intestinal transit and fluid accumulation, at least in part, by inhibition of neural pathway mediating intestinal serotonin release (*Eur. J. Pharmacol.* 1988, 145, 55).

The effects of morphine (10.0 mg/kg, i.p.) on haemodynamics, arrhythmias and plasma and myocardial catecholamines (CA) were studied after coronary artery occlusion in anaesthetised rats. It caused significant increase in mean arterial blood pressure which was due to

higher plasma noradrenaline concentration found 30 min after morphine administration. Morphine increased area of catecholamine-containing fluorescing neurones in myocardium 60 min after sham-operation. In morphine-treated rats, heart rate was significantly lowered for first 15-18 min after administration. It had no significant effect on arrhythmias developing as a result of coronary occlusion (*Brit. J. Pharmacol.* 1987, 90, 247); morphine (10.0 μ g, i.c.v.) restored basic somesthetic activity of dorsal horn convergent neurones in rat (*Eur. J. Pharmacol.* 1988, 148, 273); cardiovascular effect of morphine determined in anaesthetised dogs at 37° and 30°; morphine (1.0 mg/kg, i.v.) produced significant cardiovascular depression only at 30°. Hypothermia increased morphine levels in plasma and cerebrospinal fluid and enhanced morphine-induced histamine release (*Arch. Int. Pharmacodyn. Ther.* 1989, 297, 133).

PARAMICHELIA (Magnoliaceae)

P. baillonii (Pierre) Hu; see *Magnolia baillonii* Pierre

PARKINSONIA (Caesalpiniaceae)

P. aculeata L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 480).

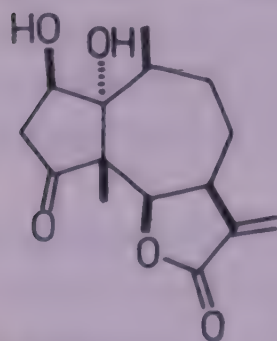
A galactomannan containing erythritol and glycerol isolated from seeds (*Carbohydr. Res.* 1988, 183, 144; *Chem. Abstr.* 1989, 110, 36758 g).

PARTHENIUM (Asteraceae)

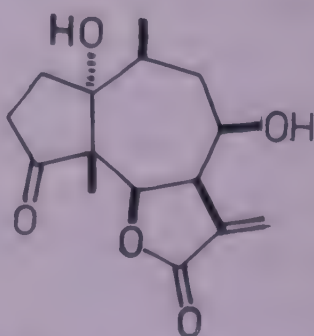
P. hysterophorus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 481).

Isolation of parthenin from leaves (*Himalayan Chem. Pharm. Bull.* 1984, 1, 6; *Chem. Abstr.* 1985, 103, 3772 j; *Curr. Sci.* 1988, 57, 1178); arginine, proline, methionine, histidine and aminocaproic acid isolated from pollens (*Sci. Cult.* 1986, 52, 124; *Chem. Abstr.* 1987, 106, 64332 z); isolation of three new ambrosanolides - 2 β -hydroxycoronopilin, 8 β -hydroxycoronopilin and 11H,13-hydroxyparthenin - from flowers and their characterisation; parthenin and coronopilin also isolated (*Phytochemistry* 1987, 26, 3359).

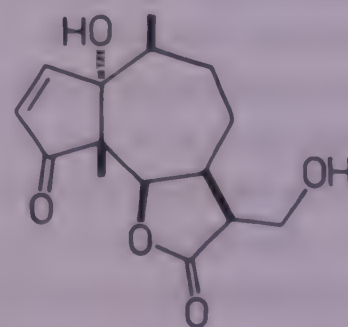
NEW COMPOUNDS



2 β -Hydroxycoronopilin



8 β -Hydroxycoronopilin



11-H,13-Hydroxyparthenin

BIOLOGICAL ACTIVITY

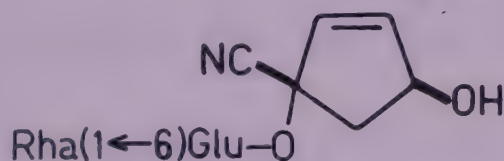
Parthenin (0.1% in chloroform) stimulated germination in *Cicer arietinum* but inhibited germination in corn; it also induced chlorosis in corn seedlings indicating a mutagenic effect (*Himalayan Chem. Pharm. Bull.* 1984, 1, 6; *Chem. Abstr.* 1985, 103, 3772 j); parthenin (1000 ppm) inhibited wheat germination and growth of *Aspergillus* (*Curr. Sci.* 1988, 57, 1178).

PASSIFLORA (Passifloraceae)

P. biflora Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 482).

Two new cyclopentenoid cyanogenic glycosides - passibiflorin and epipassibiflorin - isolated and characterised as 1-(6-O- β -D-rhamnopyranosyl- β -D-glucopyranosyloxy)-4-hydroxy-cyclopent-2-en-1-nitrile and its C-1 epimer respectively (*Phytochemistry* 1985, 24, 981).

NEW COMPOUNDS



Passibiflorin

P. coerulea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 482).

A sulphate ester of tetraphyllin B isolated and its structure elucidated as (1S,4S)1-(β -D-glucopyranosyloxy)-4-hydroxy-2-cyclopenten-1-carbonitrile-4-O-sulphate (I) (*Phytochemistry* 1989, 28, 1527).

NEW COMPOUNDS



I

P. foetida L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 517).

Pachypodol, ermanin and 7,4'-dimethoxyapigenin isolated from leaf surface (*Actual Biol.* 1985, 14, 58; *Chem. Abstr.* 1986, 105, 187580 r; *Rev. Latinoam. Quim.* 1980, 20, 6; *Chem. Abstr.* 1989, 111, 112303 t); 7,4'-dimethoxynaringenin and 3,5-dihydroxy-7,4'-dimethoxyflavanone also isolated (*Rev. Latinoam. Quim.* 1989, 20, 6; *Chem. Abstr.* 1989, 111, 112303 t).

BIOLOGICAL ACTIVITY

Pachypodol, 7,4'-dimethoxyapigenin, ermanin, 7,4'-dimethoxynaringenin and 3,5-dihydroxy-7,4'-dimethoxyflavanone exhibited deterrent activity against larvae of *Dione juno*

and *Cycada* species and activity of extract containing total flavonoids was greater than that of the individual compounds (*Rev. Latinoam. Quim.* 1989, 20, 6; *Chem. Abstr.* 1989, 111, 112303 t).

P. racemosa Brot.

(1S,4S)-1-(β -D-Glucopyranosyloxy)-4-hydroxy-2-cyclopenten-1-carbonitrile-4-O-sulphate isolated (*Phytochemistry* 1989, 28, 1527).

Distribution : Introduced into Indian gardens.

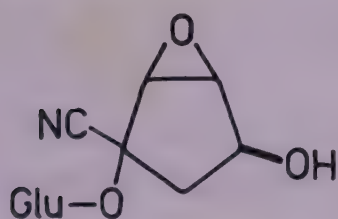
P. suberosa L.

Eng. - Passion flower.

New cyclopentenoid cyanogenic glycosides - passisuberosin, epipassisuberosin (C-1 epimer) and their respective diglucosides - isolated and their structures elucidated; passicoriacin and epipassicoriacin also isolated (*Phytochemistry* 1987, 26, 1665).

Distribution : Introduced into Indian gardens.

NEW COMPOUNDS



Passisuberosin



Passicoriacin



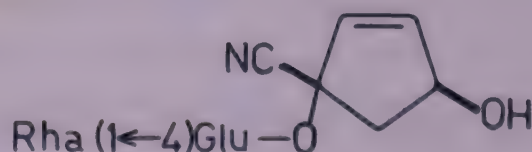
Epipassicoriacin

P. trifasciata Lem.

A new cyclopentenoid cyanogenic glycoside - passitrifasciatin - isolated and its structure elucidated as 1-(4-O- β -D-rhamnopyranosyl- β -D-glucopyranosyloxy)-4-hydroxycyclopent-2-en-1-nitrile (*Phytochemistry* 1985, 24, 981).

Distribution : Introduced into India and grown in gardens.

NEW COMPOUNDS



Passitrifasciatin

PAULOWNIA (Scrophulariaceae)

P. tomentosa Steud. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 482).

Isolation of (+)piperitol (*Planta Med.* 1987, 53, 504).

PEDICULARIS (Scrophulariaceae)

P. oederi Vahl ssp. *oederi* syn. *P. versicolor* Wahlb.

Isolation of oleanolic acid and β -sitosterol from whole plant (*Indian J. Chem.* 1989, 28B, 356).

Distribution : Himalayas, from Kashmir to Sikkim, alt. 2700-4500 m.

P. pectinata Wall. ex Benth. (*P. pectinata* Wall.) (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 187).

Friedelin, β -amyrin, taraxerol and its acetate isolated from roots (*Fitoterapia* 1987, 58, 287).

P. versicolor Wahlb.; see *P. oederi* Vahl ssp. *oederi*

PEDILANTHUS (Euphorbiaceae)

P. tithymaloides (L.) Poit. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 518).

A new proteolytic enzyme - pedilanthain - isolated from latex (*Indian J. Pharm. Sci.* 1984, 46, 223); isolation of a new triterpene - dehydrodammaranol A - from leaves together with n-hentriacontanol (*J. Indian Chem. Soc.* 1989, 66, 213).

BIOLOGICAL ACTIVITY

Pedilanthain exhibited anthelmintic activity against earthworm (*Indian J. Pharm. Sci.* 1984, 46, 223); it exhibited anti-inflammatory activity stronger than phenylbutazone in carrageenin-induced paw oedema in rats; its oral ED₅₀ was 168.5 mg/kg (*Indian J. Pharm. Sci.* 1988, 50, 281).

PELARGONIUM (Geraniaceae)

P. graveolens L'Herit. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 484).

Determination of citronellol (27.54), geraniol (19.08), linalool (10.16), caryophyllene (8.07) and citronellyl acetate (7.75%) in leaf oil by GC (*PAFAI J.* 1987, 9, 11; *Chem. Abstr.* 1988, 108, 209980 n).

PELTOPHORUM (Caesalpiniaceae)

P. ferrugineum (Decne.) Benth.; see *P. pterocarpum* (DC.) Backer ex K. Heyne

P. pterocarpum (DC.) Backer ex K. Heyne syn. *P. ferrugineum* (Decne.) Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 485).

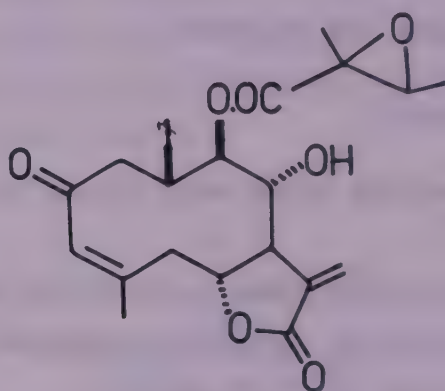
Isolation and structure elucidation of leucocyanidin-3-O- α -D-galactopyranoside from stem bark (*Curr. Sci.* 1986, 55, 179).

PENTANEMA (Asteraceae)

P. indicum (L.) Ling syn. *Vicoa auriculata* Cass., *V. indica* (L.) DC., *Inula indica* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 485).

A new germacranolide - vicolide D - isolated and its structure determined (*Indian J. Chem.* 1986, 25B, 417); isolation of 5,6,3'-trihydroxy-7,4'-dimethoxyflavone from whole plant (*Indian Drugs* 1986, 23, 480).

NEW COMPOUNDS



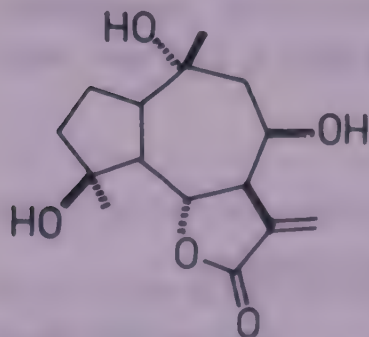
Vicolide D

P. vestitum (Wall. ex DC.) Ling syn. *Vicoa vestita* (Wall. ex DC.) Benth. ex Hook.f.

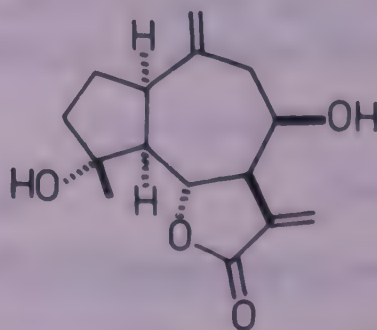
A new guaianolide - vestolide - isolated from aerial parts and its structure elucidated (*Phytochemistry* 1984, 23, 2379); isolation of another guaianolide - vestenolide - and its characterisation (*J. Nat. Prod.* 1985, 48, 249); a new pseudoguaiane acid - vestic acid - along with bergenin isolated from aerial parts and its structure established (*Indian J. Chem.* 1987, 26B, 503).

Distribution : Throughout drier parts of India, in plains.

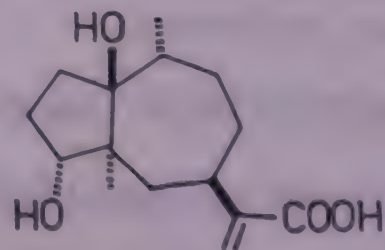
NEW COMPOUNDS



Vestolide



Vestenolide



Vestic acid

PENTAPANAX (Araliaceae)

P. leschenaultii (DC.) Seem. syn. *P. leschenaultii* (DC.) Seem. var. *umbellatum* (Seem.) Clarke

Ethanolic extract of fruits immobilized human spermatozoa.

Spermicidal activity due to oleanolic acid (0.01) and triterpene glycosides (1.2%) present in extract; α -amyrin, β -sitosterol and its glucoside isolated (*Herba Pol.* 1988, 34, 161; *Chem. Abstr.* 1989, 111, 171168 a).

Distribution : Himalayas, from Kashmir to Bhutan, alt. 1600-3700 m.

P. leschenaultii (DC.) Seem. var. *umbellatum* (Seem.) Clarke; see *P. leschenaultii* (DC.) Seem.

P. parasiticum (Buch.-Ham. ex D.Don) Seem. (*parasiticus*) syn. *P. parasiticum* (Buch.-Ham. ex D.Don) Seem. var. *khasiana* Clarke

Hentriacontane, hentriacontanone, 2-heneicosanone, α -amyrin, quercetin-3-O-rhamnoside, sitosterol and its glucoside isolated from aerial parts (*Fitoterapia* 1984, 55, 255).

Distribution : Himalayas, from Kumaon to Nepal, alt. 2100-2400 m and Khasia Hills, alt. 1500 m.

P. parasiticum (Buch.-Ham. ex D.Don) Seem. var. *khasiana* Clarke; see *P. parasiticum* (Buch.-Ham. ex D.Don) Seem.

PERESKIA (Cactaceae)

P. aculeata Mill.

Eng. - Barbados gooseberry.

A heteropolysaccharide containing protein (3.5%) and arabinose, galactose, rhamnose and galacturonic acid in molar ratio of 5.1:8.2:1.8:1.0, isolated from leaves (*Phytochemistry* 1987, 26, 1709).

Distribution : Grown in Indian gardens.

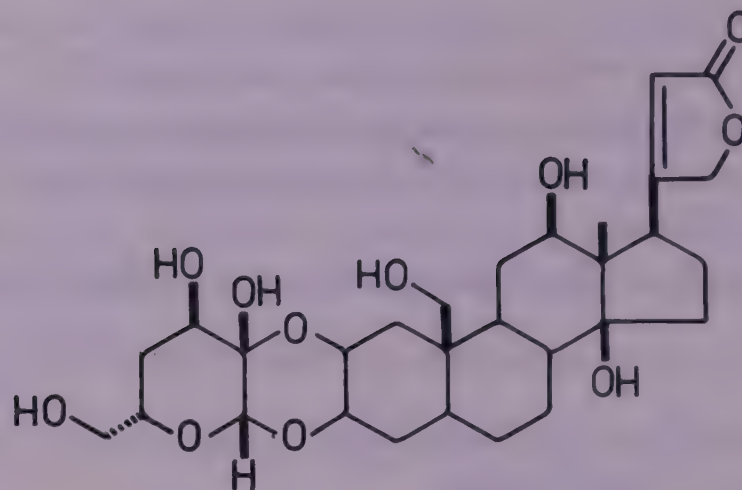
PERGULARIA (Asclepiadaceae)

P. pallida W. & A.; see *Telosma pallida* (Roxb.) Craib

P. tomentosa L. syn. *Daemia cordata* R.Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 188).

A new cytotoxic cardiac glycoside - ghalakinoside - isolated together with calactin and its structure determined (*Phytochemistry* 1988, 27, 3245).

NEW COMPOUNDS



Ghalakinoside

PERILLA (Lamiaceae)

P. frutescens (L.) Britt. syn. *P. ocimoides* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 486).

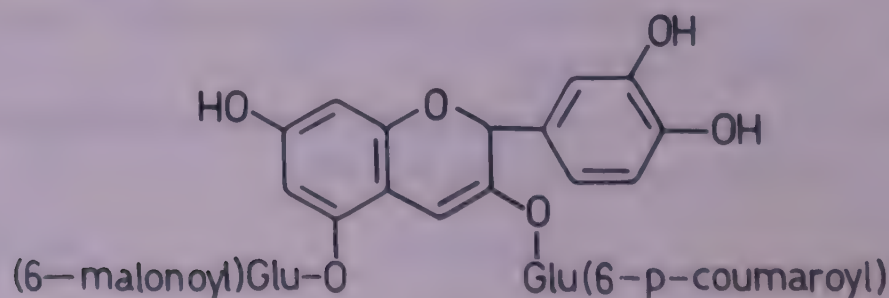
Crude extract of aerial parts exhibited antifertility activity (*J. Nepal Chem. Soc.* 1981, 1, 18; *Chem. Abstr.* 1985, 103, 119975 g).

Ethyl linolenate, linolenic acid and β -sitosterol isolated from aerial parts (*J. Nepal Chem. Soc.* 1981, 1, 18; *Chem. Abstr.* 1985, 103, 119975 g); isolation of perillene, perillaketone, egomaketone and isoegomaketone from aerial parts (*J. Indian Chem. Soc.* 1989, 66, 183).

P. frutescens (L.) Britt. var. *crispa* (Benth.) Decne. ex Bailey syn. *P. ocimoides* L. var. *crispa* Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 486).

Isolation of rosmarinic acid from leaves of Japanese plant (*Yakugaku Zasshi* 1986, 106, 1108; *Chem. Abstr.* 1987, 106, 125761 n); a pigment - malonylshisonin - isolated from leaves and characterised as 3-O-(6-O-(E)-p-coumaroyl- β -D-glucopyranosyl)-5-O-(6-O-malonyl- β -D-glucopyranosyl)cyanidin (*Agric. Biol. Chem.* 1989, 53, 797).

NEW COMPOUNDS



Malonylshisonin

P. ocimoides L.; see *P. frutescens* (L.) Britt.

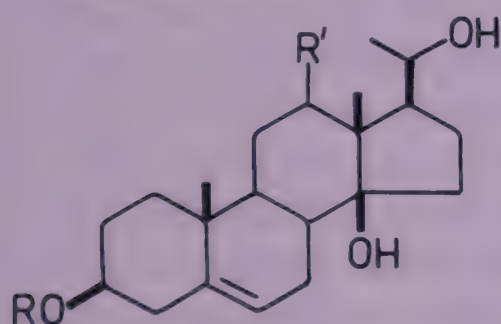
P. ocimoides L. var. *crispa* Benth.; see *P. frutescens* (L.) Britt. var. *crispa* (Benth.) Decne. ex Bailey

PERIPLOCA (Asclepiadaceae)

P. calophylla (Wt.) Falc. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 487).

A new pregnane ester diglucoside - plocin - and its aglycone - plocigenin - isolated from twigs; plocin characterised as 12,20-di-O-benzoyl-drevogenin D-3-O- β -D-oleandropyranosyl(1 \rightarrow 4)-O- β -D-oleandropyranoside (*Phytochemistry* 1985, 24, 1037); another pregnane ester diglucoside of ornogenin - plocinine - isolated from twigs and its structure elucidated as 12,20-di-O-cinnamoylsarcostin-3-O- α -L-oleandropyranosyl(1 \rightarrow 4)-O- α -L-oleandropyranoside (*Phytochemistry* 1985, 24, 3015); isolation of a new pregnane glycoside - locin - from twigs and its characterisation as boucerin-3-O- β -D-digitoxoside (*Indian J. Chem.* 1986, 25B, 44); another new pregnane glycoside - calocinin - isolated from twigs and its structure established as calogenin-3-O- β -L-2,6-dideoxyfucopyranoside (*J. Nat. Prod.* 1988, 51, 787).

NEW COMPOUNDS

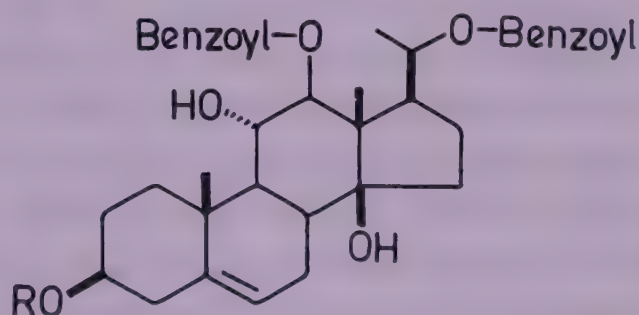


Calocinin

R = 2',6'-Dideoxyfucose, R' = H

Locin

R = Digitoxose, R' = β -OH

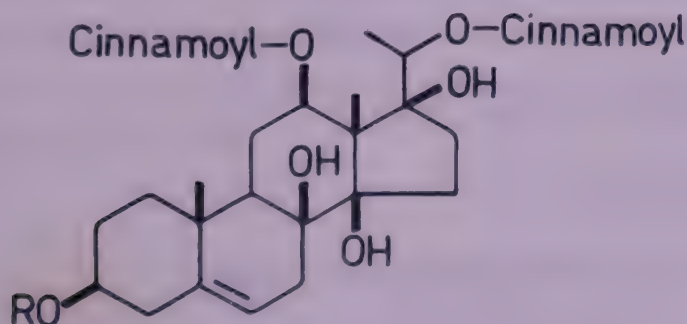


Plocin

R = Oleandrose(4 \rightarrow 1)Oleandrose

Plocigenin

R = H



Plocinine

R = Oleandrose(4 \rightarrow 1)Oleandrose

PERSEA (Lauraceae)

P. americana Mill. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 522).

Two arabinoxylans, one of which was composed of arabinose and xylose in molar ratio of 3:1 and other of xylose and arabinose in molar ratio of 19:1, isolated from bark (*Carbohydr. Res.* 1988, 177, 117; *Chem. Abstr.* 1988, 109, 89751 k).

PETROSELINUM (Apiaceae)

P. crispum (Mill.) A. W. Hill syn. *P. sativum* Hoffm., *Apium petroselinum* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 488).

Acute LD₅₀ of extract containing allyltetramethoxybenzene was 0.85 g/kg in mice; this extract showed spasmolytic action in guinea pig whereas extract without allyltetramethoxybenzene had acute LD₅₀ 3.80 g/kg in mice and exhibited cholagogic action in rats (*Fiziol. Akt. Veshchestva* 1987, 19, 75; *Chem. Abstr.* 1988, 108, 52829 v).

2-(p-Tolyl)propan-2-ol isolated from leaves together with apiole, 4-isopropenyl-1-methylbenzene, p-mentha-1,3,8-triene, myristicin and β -phellandrene (*Phytochemistry* 1985, 24, 2623); imperatorin, isopimpinellin, psoralen, 5-methoxypsoralen, 8-methoxypsoralen and oxyeucedanin identified in leaves and roots (*Planta Med.* 1986, 52, 462); 1,4-butanediol, 2-isopropoxyethane, octane-4,5-dione and sabinyol acetate identified in leaf essential oil (*Izv. Akad. Nauk Mold. SSR, Ser. Biol. Khim. Nauk* 1987, 24; *Chem. Abstr.* 1987, 107, 93510 g); allyltetramethoxybenzene, myristicin and apiole isolated from fruits (*Fiziol. Akt. Veshchestva* 1987, 19, 75; *Chem. Abstr.* 1988, 108, 52829 v); oil from roots (0.15), fruits (3.9) and foliage (0.21%) contained flavonoids (0.03, 0.07 and 0.36), sugars (9.0, 0.03 and 3.9%) respectively; apiole, bergapten, camphene, isopimpinellin, myristicin, α -pinene, psoralen and xanthotoxin isolated from roots, fruits and leaves (*Farm. Pol.* 1987, 43, 215; *Chem. Abstr.* 1988, 108, 91677 p).

P. sativum Hoffm.; see *P. crispum* (Mill.) A.W. Hill

PEUCEDANUM (Apiaceae)

P. graveolens (L.) Benth. & Hook.f.; see *Anethum graveolens* L.

P. sowa Kurz; see *Anethum graveolens* L.

PHARBITIS (Convolvulaceae)

P. purpurea (L.) Voigt; see *Ipomoea purpurea* (L.) Roth

PHASEOLUS (Papilionaceae)

P. aureus Roxb.; see *Vigna radiata* (L.) Wilczek var. *radiata*

P. mungo L.; see *Vigna mungo* (L.) Hepper and *V. radiata* (L.) Wilczek var. *radiata*

P. radiatus L.; see *Vigna radiata* (L.) Wilczek var. *radiata*

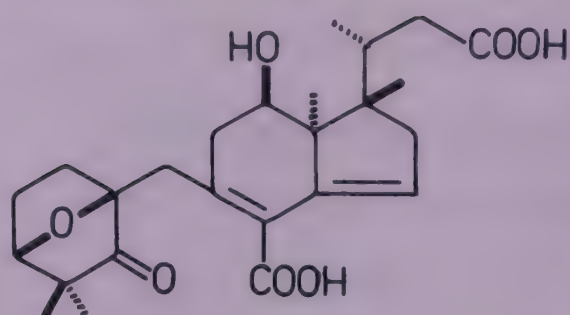
P. radiatus L. var. *aureus* (Roxb.) Prain; see *Vigna radiata* (L.) Wilczek var. *radiata*

P. trilobus Ait.; see *Vigna trilobata* (L.) Verdc.

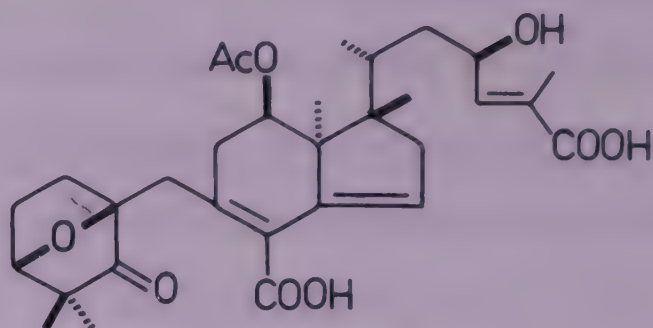
P. vulgaris L. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 489).

A natural hatching stimulant for soybean cyst nematode - glycinoclepin A - isolated from roots as its bis(p-bromophenacyl) ester (*Chem. Commun.* 1985, 222); new nortriterpenes - glycinoclepins B and C - isolated from roots and their structures elucidated (*Tetrahedron Lett.* 1985, 26, 5539); a high molecular weight amide-linked indole-3-acetic acid conjugate isolated from seeds (*Plant Physiol.* 1986, 80, 99; *Chem. Abstr.* 1986, 104, 126541 m); isoquercitrin, kaempferol, its 3-glucuronide, quercetin, its 3-glucuronide, robinin and rutin identified (*Khim. Pri. Soedin.* 1986, 782; *Chem. Abstr.* 1987, 106, 172934 f); isolation of a new brassinosteroid - 6-deoxodihydrohomodolichosterone - along with brassinolide, castasterone, dolicholide, dolichosterone, 6-deoxodihydrodolichosterone and 6-deoxodihydrocastasterone from seeds (*Agric. Biol. Chem.* 1987, 51, 1625); isolation of 25-methyldolichosterone and its structure determination (*Agric. Biol. Chem.* 1987, 51, 2303); 24-methylene-25-methylcholesterol, 24-ethyl-desmosterol and clerosterol from seeds (*Phytochemistry* 1988, 27, 629); a new triterpenoid saponin - soyasaponin V - isolated and characterised (*J. Sci. Food Agric.* 1988, 43, 101; *Chem. Abstr.* 1988, 108, 218997 a); isolation of new triterpenoid glucoside - soyasapogenol B-24-O- β -D-glucoside - from seeds and its structure determination (*Phytochemistry* 1988, 27, 1216); five new compounds - 25-methylgramisterol, 24(Z)ethylidene-4 α -methyl-5 α -cholest-8(14)-en-3 β -ol, 24(E)- and 24(Z)ethylidene-4 α ,14 α -dimethyl-5 α -cholest-8-en-3 β -ols and 24(Z)ethylidene-4 α ,14 α -dimethyl-5 α -cholest-9(11)-en-3 β -ol - isolated from seeds and characterised; 28-isocitrostadienol, 4 α -methylfucosterol, 24(Z)ethylidene-4 α -methylcholest-8-en-3 β -ol and 24-methylene-4 α ,14 α -dimethyl-5 α -cholest-9(11)-en-3 β -ol also isolated (*Phytochemistry* 1989, 28, 1219).

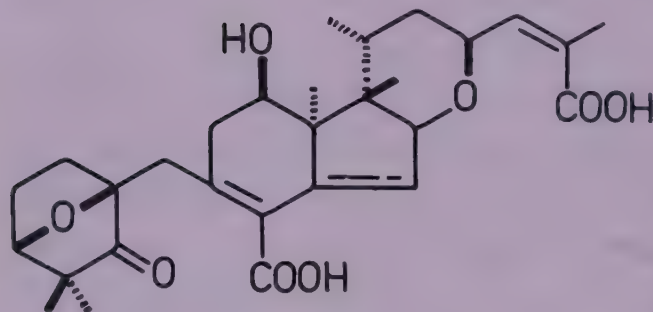
NEW COMPOUNDS



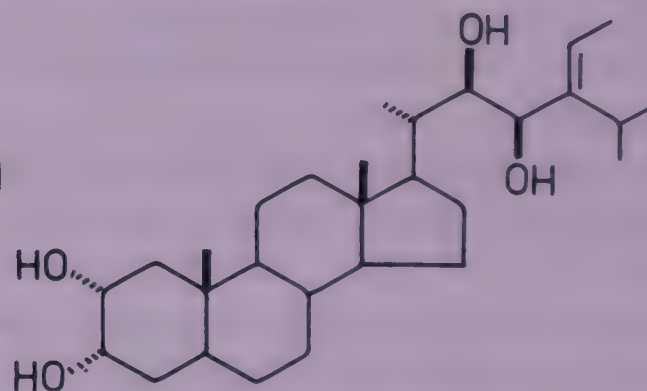
Glycinoeclepin A



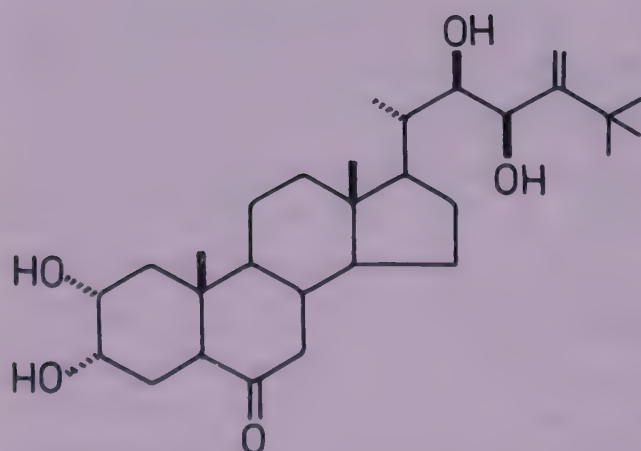
Glycinoeclepin B



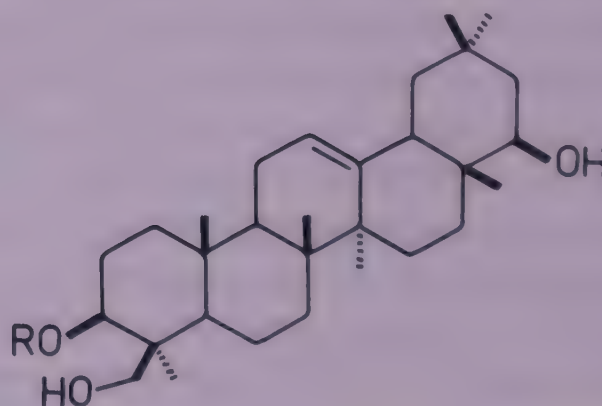
Glycinoeclepin C



6-Deoxodihydrohomodolichosterone



25-Methyldolichosterone



Soyasaponin V

R = Gluc. acid(2→1)Gal(2→1)Glu

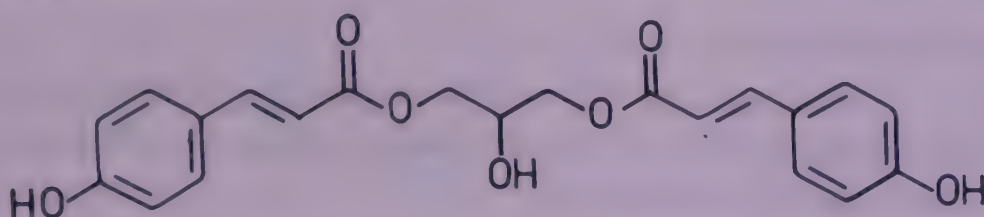
PHLEUM (Poaceae)*P. pratense* L.

Eng. - Timothy grass.

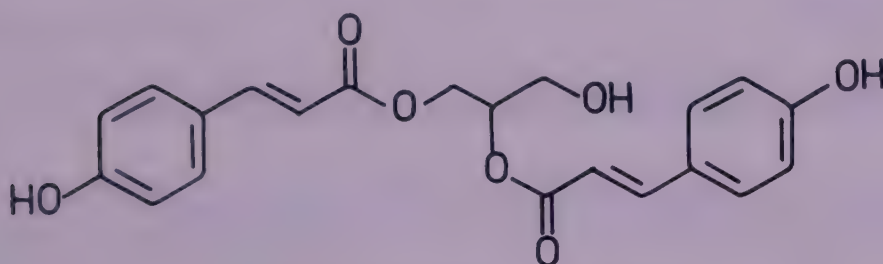
Three new phenolic acid derivatives - 1,3-O-di-trans-p-coumaroylglycerol (I), 1,2-O-di-trans-p-coumaroylglycerol (II) and chokorin - isolated from plant infected with *Epichloe typhina* and characterised; cis- and trans-p-coumaric acids, p-hydroxybenzoic acid, p-hydroxyphenylacetic acid and tyrosol also isolated (*Phytochemistry* 1988, 27, 1333).

Distribution : Indigenous to Europe and introduced into India as fodder grass in Shimla and Shillong.

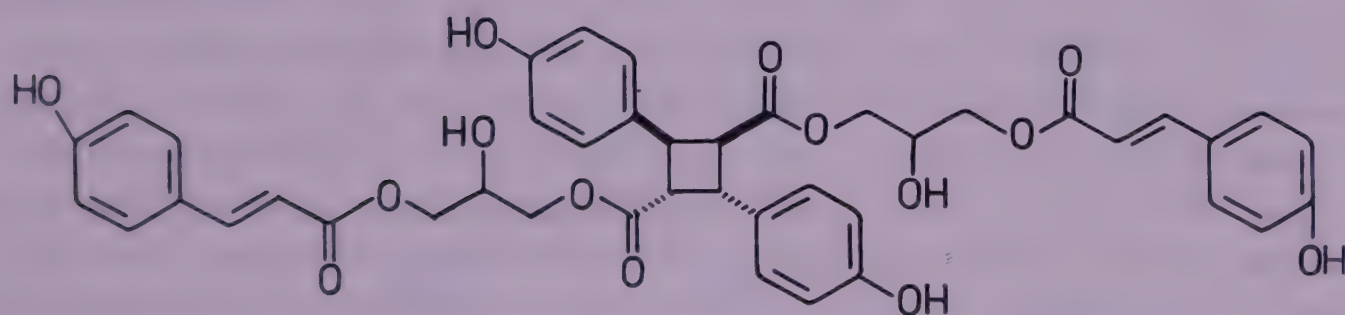
NEW COMPOUNDS



I



II



Chokorin

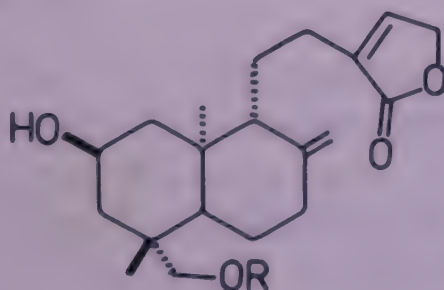
PHLOGACANTHUS (Acanthaceae)

P. thyrsiflorus (Roxb.) Nees; see *P. thyrsiformis* (Hardw.) Mabberley

P. thyrsiformis (Hardw.) Mabberley syn. *P. thyrsiflorus* (Roxb.) Nees (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 491).

Isolation of a new diterpene lactone - phlogantholide A - from leaves and its structure elucidation (*Phytochemistry* 1985, 24, 2037); phloganthoside isolated and characterised as phlogantholide A-19-O- β -D-glucoside (*Phytochemistry* 1987, 26, 491).

NEW COMPOUNDS



Phloganthoside

R = Glu

Phlogantholide A

R = H

PHLOMIS (Lamiaceae)

P. spectabilis Falc. ex Benth.

Kaempferol-7,4'-di-O-methyl-3-O-[6''-O-(E)-p-coumaroyl]- β -D-glucopyranoside isolated and characterised; kaempferol-7,4'-dimethyl ether-3-glucoside, tiliroside and astragalin also isolated (*Phytochemistry* 1985, 24, 1124).

Distribution : Kashmir, alt. 900-2400 m.

PHOENIX (Arecaceae)

P. dactylifera L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 492).

Oil exhibited antibacterial and antifungal activities and dose- dependent CNS-depressant activity accompanied by hypothermia and muscle relaxation (*Fitoterapia* 1986, 57, 284).

4-Hydroxybenzaldehyde, 4-hydroxy-3-methoxybenzaldehyde, 3,5-dihydroxy-4-methoxybenzaldehyde, benzoic acid, 4-hydroxybenzoic acid, 4-hydroxy-3-methoxycinnamic acid and 3,5-dihydroxy-4-methoxybenzoic acid isolated from stem; glucosides of campesterol, stigmasterol and apigenin also isolated (*An. Quim.* 1985, 81C, 208; *Chem. Abstr.* 1986, 105, 39375 n); 3,4-dimethoxytoluene identified as major component in oil from Saudi Arabian plant (*Fitoterapia* 1986, 57, 284); isolation of three new flavonoid sulphates - quercetin-3-glucoside sulphate, luteolin-7-glucoside disulphate and chrysoeriol-7-glucoside disulphate - from fruits and their characterisation; luteolin- and chrysoeriol-7-glucoside sulphates, 7-glucoside and 7-rutinoside of chrysoeriol, luteolin-7-rutinoside, quercetin-3-glucoside, isorhamnetin-3-glucoside and -3-rutinoside also isolated (*Rev. Agroquim. Tecnol. Aliment.* 1988, 28, 581; *Chem. Abstr.* 1989, 111, 20859 a).

BIOLOGICAL ACTIVITY

3,4-Dimethoxytoluene exhibited antibacterial, antifungal and dose-dependent CNS depressant activities accompanied by hypothermia and muscle relaxation (*Fitoterapia* 1986, 57, 284).

PHOLIDOTA (Orchidaceae)

P. rubra Lindl.; see *P. undulata* Lindl.

P. undulata Lindl. syn. *P. rubra* Lindl.

Pholidotin isolated (*Indian J. Chem.* 1987, 26B, 297).

Distribution : Sikkim and Meghalaya, alt. 1200-1800 m.

PHRAGMITES (Poaceae)

P. australis (Cav.) Trin. ex Steud. syn. *P. communis* Trin. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 492).

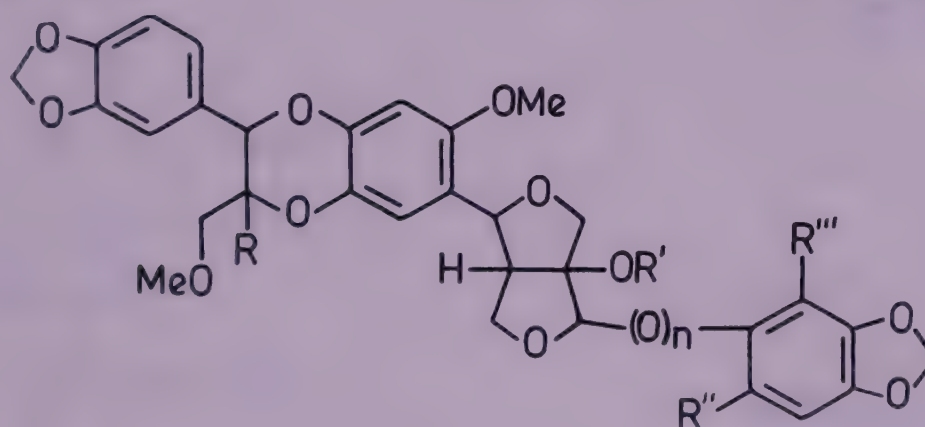
Bufotenine, N,N-dimethyltryptamine, 5-methoxy-N-methyltryptamine and gramine isolated from rhizomes (*Sci. Pharm.* 1985, 53, 169; *Chem. Abstr.* 1986, 104, 48723 f).

P. communis Trin.; see *P. australis* (Cav.) Trin. ex Steud.

PHRYMA (Phrymataceae)

P. leptostachya L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 529).

Two new pesticidal sesquilignans (I and II) isolated from seeds (Eur. 237,271 (1987) Sep. 16; *Chem. Abstr.* 1988, 108, 72422 k).

NEW COMPOUNDS

I

R, R', R'', R''' = H, n = 0

II

R = OH, R' = Ac, R'', R''' = OMe, n = 1

BIOLOGICAL ACTIVITY

Topical application of sesquilignan II (0.3 μ g/fly) was lethal to housefly (Eur. 237,271 (1987) Sep. 16; *Chem. Abstr.* 1988, 108, 72422 k).

PHYLA (Verbenaceae)

P. nodiflora (L.) Greene syn. *Lippia nodiflora* Mich. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 493).

Petroleum ether and chloroform extracts suppressed exploratory behaviour and spontaneous motor activity of mice; petroleum ether extract antagonised (+)amphetamine stereotypy, suppressed acetic acid writhing and carrageenin-induced oedema without

inhibiting granulation tissue formation; LD50 of two extracts of mice were 2.28 g/kg and 2.40 g/kg respectively (*J. Res. Ayurveda & Siddha* 1989, 10, 141).

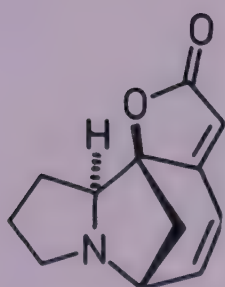
A complex mixture of hydrocarbons and oxygenated compounds isolated from volatile fraction; among hydrocarbons calamene and β -caryophyllene predominated whereas 1-octen-3-ol, phenethyl alcohol, linalool, p-cymen-8-ol and methyl salicylate constituted 10-20% of total oxygenated compounds (*J. Nat. Prod.* 1985, 48, 504).

PHYLLANTHUS (Euphorbiaceae)

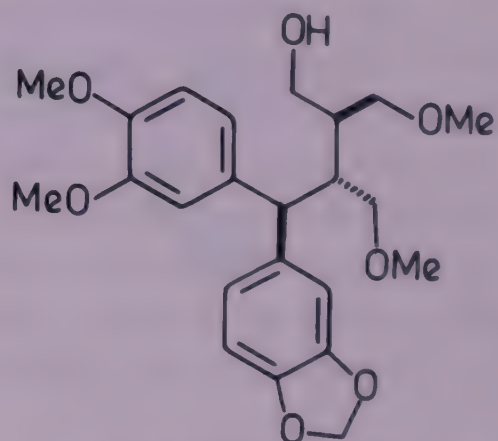
P. amarus Schum. & Thonn. syn. *P. niruri* sensu Hook.f., p.p. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 493).

Ent-norsecurinine isolated and its crystal structure determined (*J. Nat. Prod.* 1986, 49, 614); isolation of new secolignan - seco-4-hydroxylintetralin - and two new hydroxylignans - seco-isolariciresinol trimethyl ether and hydroxyniranthin - from leaves and their structure determination; dibenzylbutyrolactone also isolated (*J. Nat. Prod.* 1988, 51, 44).

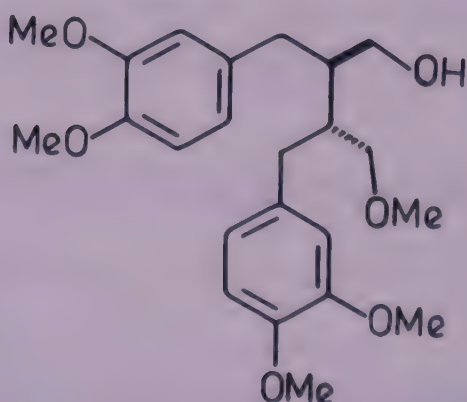
NEW COMPOUNDS



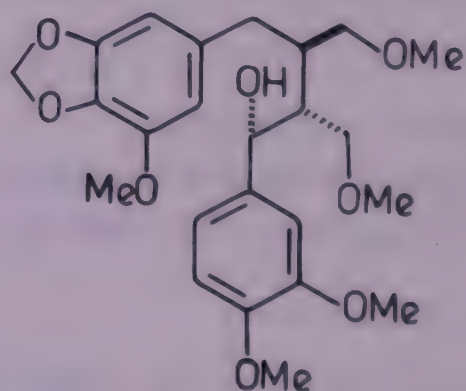
Ent-norsecurinine



Seco-4-hydroxylintetralin



Seco-isolariciresinol trimethyl ether



Hydroxyniranthin

BIOLOGICAL ACTIVITY

Dibenzylbutyrolactone exhibited antitumor activity (*J. Nat. Prod.* 1988, 51, 44).

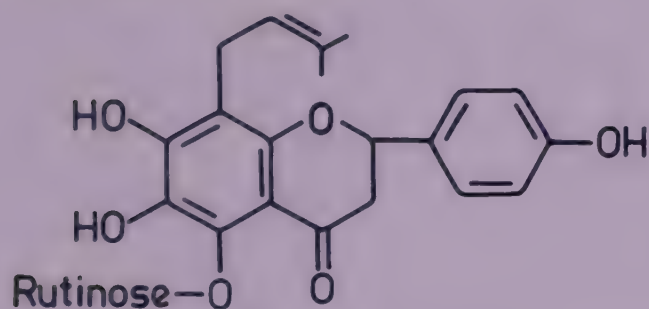
P. emblica L.; see *Emblica officinalis* Gaertn.

P. fraternus Webster syn. *P. niruri* sensu Hook.f. p.p. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 494).

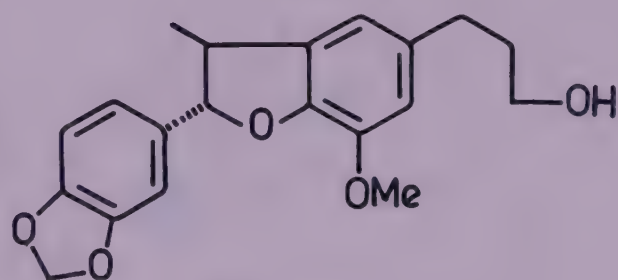
Leaf extract protected 50% of rats whereas root extract showed complete protection against hepatic damage induced by alcohol (*Indian J. Pharmacol.* 1986, 18, 211).

A new flavone glycoside isolated and characterised as fisetin-4'-O-glucoside; rutin, quercetin, quercitrin and astragalin also isolated (*Shoyakugaku Zasshi* 1984, 38, 213; *Chem. Abstr.* 1985, 102, 137638 h); isolation of new prenylated flavanone glycoside - nirurin - and its structure elucidation (*J. Nat. Prod.* 1984, 47, 958); new triterpenoids - phyllanthanol, phyllanthenone and phyllanthol - isolated and characterised (*Indian J. Chem.* 1989, 28B, 319); a new lignan - nirphyllin - and a new neolignan - phyllnirurin - from aerial parts and their structure determination (*J. Nat. Prod.* 1989, 52, 48).

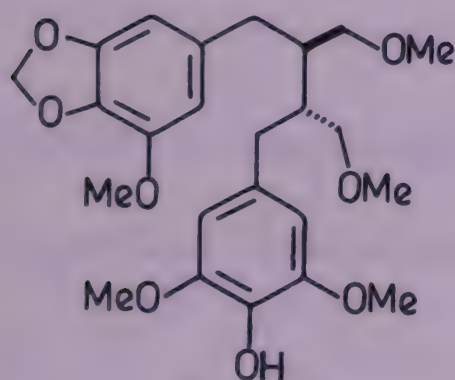
NEW COMPOUNDS



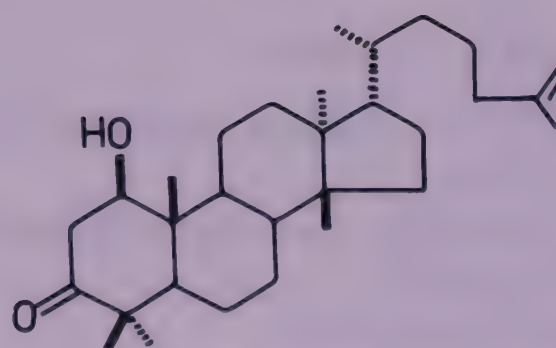
Nirurin



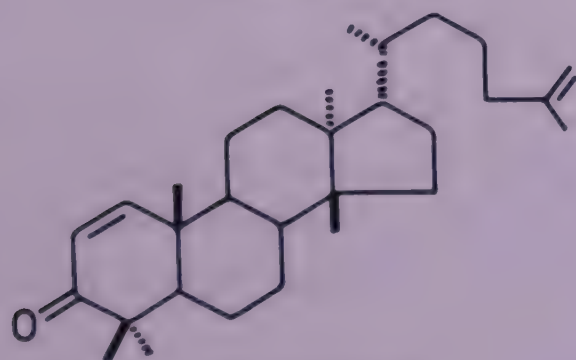
Phyllnirurin



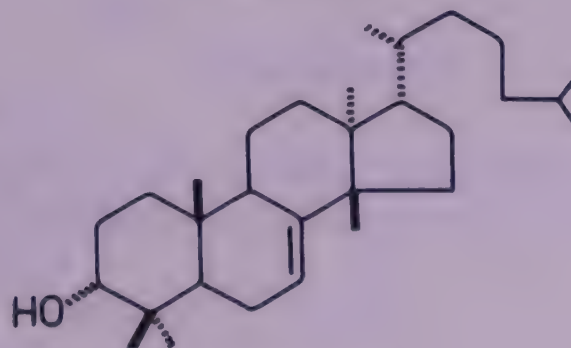
Nirphyllin



Phyllanthanol



Phyllanthenone



Phyllanthol

P. maderaspatensis L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 191).

Seed contained 16.3% oil and 14.6% protein; linolenic acid (64.4%) was predominant fatty acid in oil (*Fette Wiss. Technol.* 1987, 89, 324; *Chem. Abstr.* 1987, 107, 174644 n).

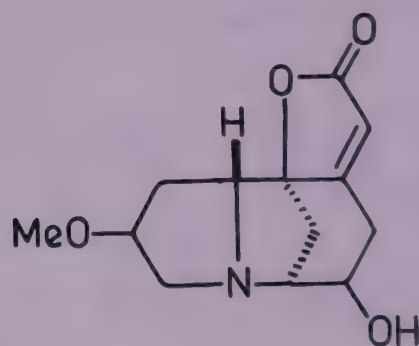
P. niruri L.; see *P. amarus* Schum. & Thonn. and *P. fraternus* Webster

P. simplex Retz.; see *P. virgatus* Forst.f.

P. virgatus Forst.f. syn. *P. simplex* Retz. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 191).

A new alkaloid - simplexine - isolated together with phyllanthine and its structure established (*Phytochemistry* 1988, 27, 3027).

NEW COMPOUNDS



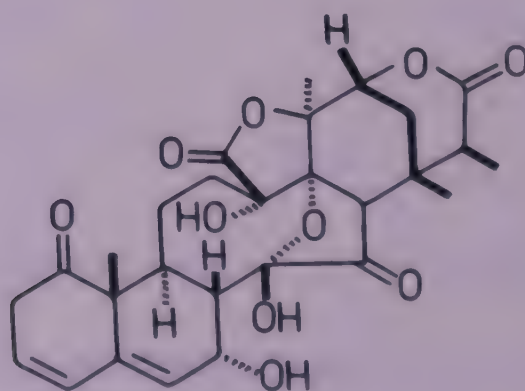
Simplexine

PHYSALIS (Solanaceae)

P. alkekengi L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 494).

Isolation and characterisation of physalin L along with physalins E and F (*Phytochemistry* 1987, 26, 3313).

NEW COMPOUNDS

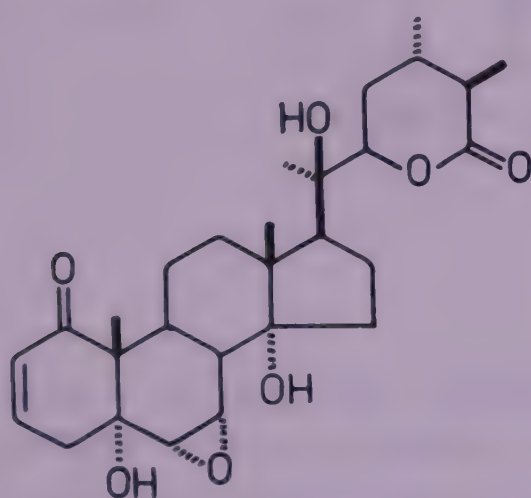


Physalin L

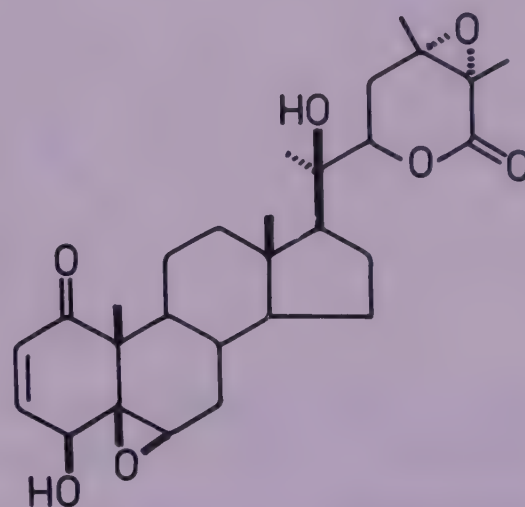
P. angulata L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 494).

Isolation of two new vitasteroids and their characterisation as 14 α -hydroxyxocarpanolide (1-oxo-5 α ,14 β ,20(R)-trihydroxy-6 α ,7 α -epoxy-22(R)-vita-2-enolide) and 24,25-epoxyvitanolide D (*Khim. Prir. Soedin.* 1986, 596; *Chem. Abstr.* 1987, 106, 135237 k); another vitasteroid - vamonolide - isolated from leaves and its structure elucidated (*Khim. Prir. Soedin.* 1987, 856; *Chem. Abstr.* 1988, 108, 201718 n); isolation of withangulatin A and its structure determination (*Biochem. Biophys. Res. Commun.* 1988, 159, 1128; *Chem. Abstr.* 1989, 110, 225104 b).

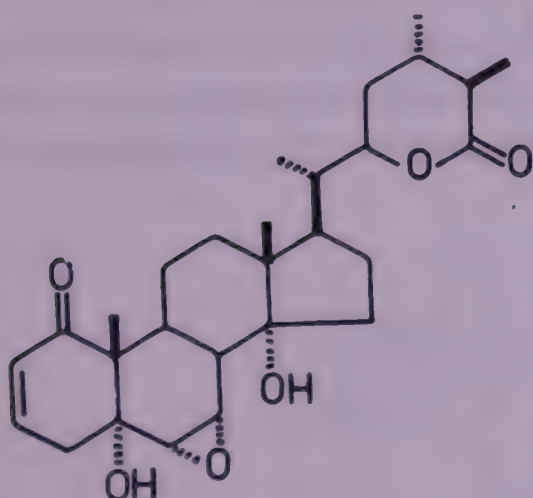
NEW COMPOUNDS



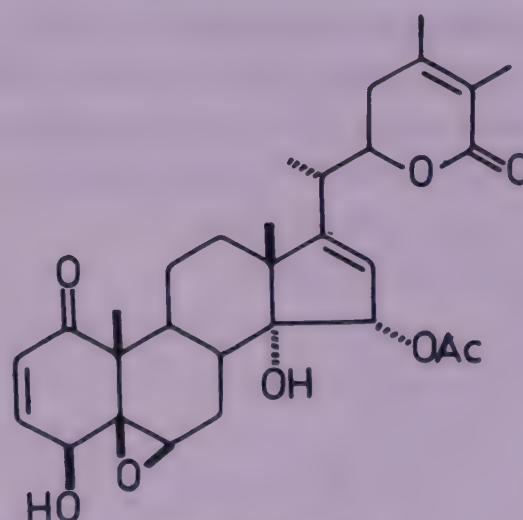
14 α -Hydroxyxocarpanolide



24,25-Epoxyvitanolide D



Vamonolide



Withangulatin A

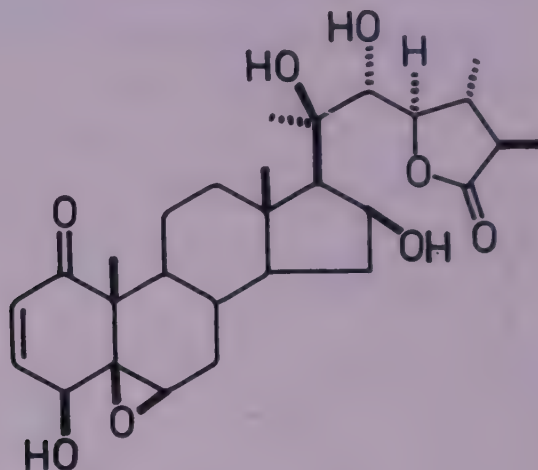
BIOLOGICAL ACTIVITY

Withangulatin A was found to act on topoisomerase II to induce topoisomerase II-mediated DNA damage *in vitro* at 0.5 and 20.0 μ M doses (*Biochem. Biophys. Res. Commun.* 1988, 159, 1128; *Chem. Abstr.* 1989, 110, 225104 b).

P. ixocarpa Brot. ex Hornem (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 532).

Ixocarpalactone A isolated (*J. Chem. Res., Synop.* 1979, 103); ixocarpanolide isolated from aerial parts and characterised by ¹³C-NMR (*Khim. Prir. Soedin.* 1986, 326; *Chem. Abstr.* 1987, 106, 192718 s).

NEW COMPOUNDS



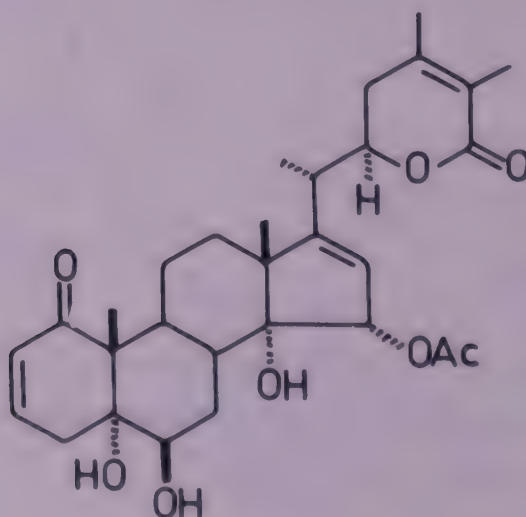
Ixocarpalactone A

P. minima L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 495).

Aqueous extract of leaf produced dose-dependent inhibition of carrageenin-induced rat paw oedema (*Fitoterapia* 1988, 59, 335).

A new ergostane-type steroid - withaminimin - isolated and its structure determined (*Phytochemistry* 1987, 26, 1801); isolation of 5-methoxy-6,7-methylenedioxyflavone and 5,6,7-trimethoxyflavone (*Phytochemistry* 1988, 27, 3708); quercetin-3-O-galactoside from leaves (*Fitoterapia* 1988, 59, 335).

NEW COMPOUNDS

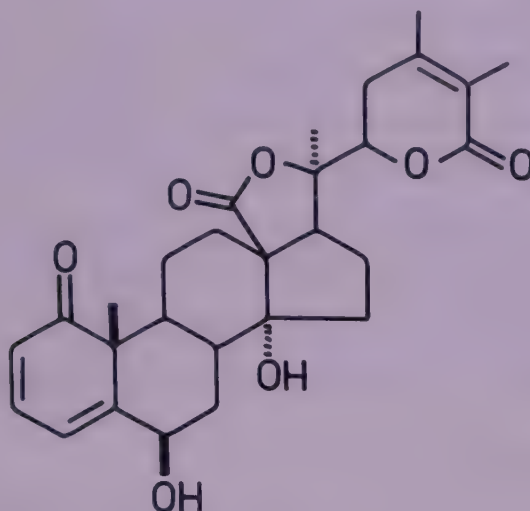


Withaminimin

P. minima L. var. *indica* Clarke (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 495).

Withaphysalin A, β -sitosterol and its acetate identified; structure elucidation of withaphysalin E (*J. Indian Chem. Soc.* 1988, 65, 740).

NEW COMPOUNDS

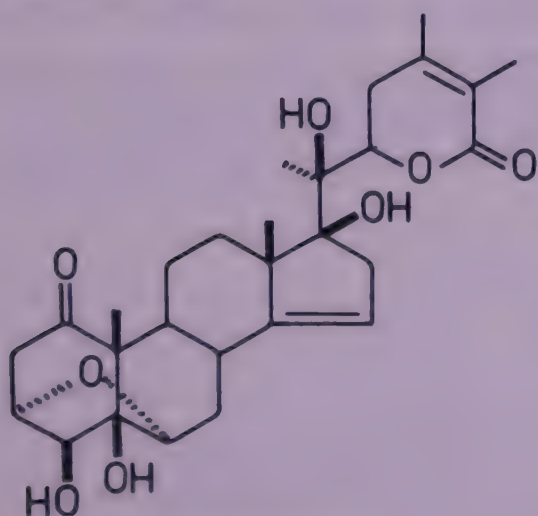


Withaphysalin E

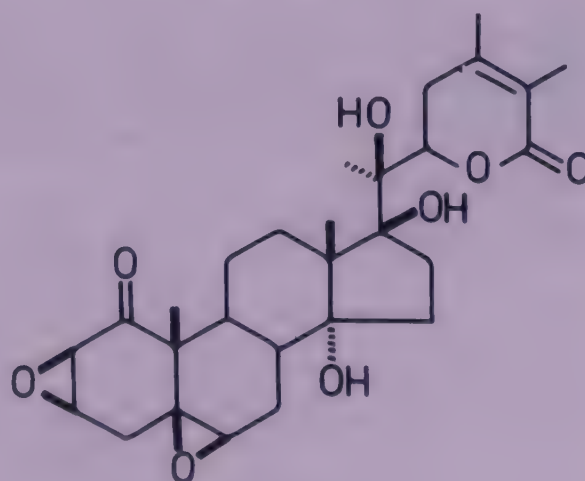
P. peruviana L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 496).

Isolation and characterisation of withaperuvins F and G from roots (*Phytochemistry* 1987, 26, 243); a new withanolide - 23-hydroxyphysalolactone - isolated from leaves and characterised as (20S,22R,23R)6 α -chloro-4 β ,5 β ,14 α ,17 β ,20,23-hexahydroxy-1-oxo-witha-2,24-dienolide (*Chem. Pharm. Bull.* 1988, 36, 2897); a new hexacyclic withanolide - withaperuvins H - isolated from roots and its structure determined (*Chem. Commun.* 1989, 628).

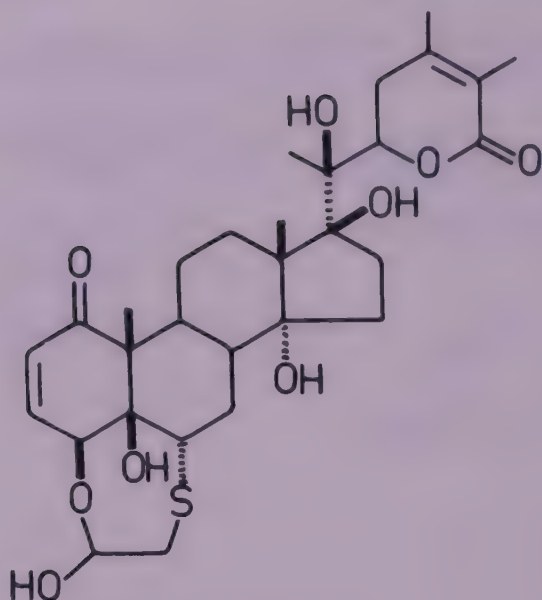
NEW COMPOUNDS



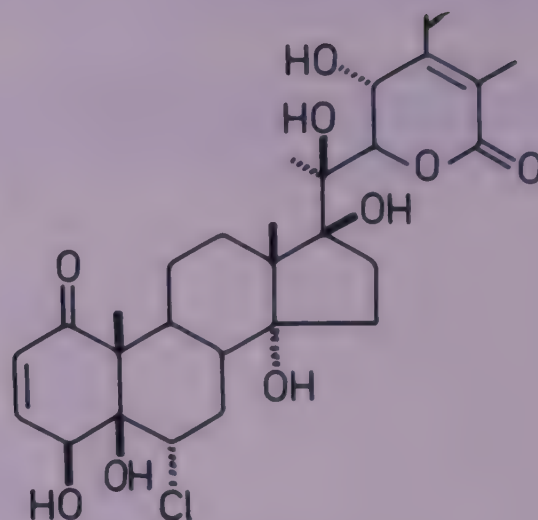
Withaperuvins F



Withaperuvins G



Withaperuvine H



23-Hydroxyphysalolactone

PHYSOSTIGMA (Papilionaceae)*P. venenosum* Balf.

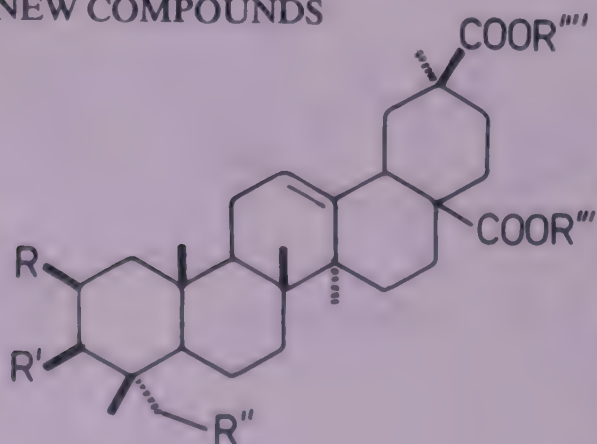
Eng. - Calabar bean, Ordeal bean.

Synthesis of geneserine (*J. Chem. Soc. Perkin 1* 1987, 2491).

Distribution : Native to West Africa, reported to have been introduced into India.

PHYTOLACCA (Phytolaccaceae)*P. acinosa* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 497).

Three new oleanane derivatives - phytolaccagenin A, acinosolic acid A and acinosolic acid B - isolated and characterised along with acinosolic, phytolaccagenic, esculentic and jaligonic acids and phytolaccagenin (*Phytochemistry* 1984, 23, 2893); phytolaccagenin and demethylphytolaccagenin isolated from roots (*Zhongcaoyao* 1984, 15, 550; *Chem. Abstr.* 1985, 102, 100667 r); synthesis of epialeuritolic acid (*Arch. Pharmacol Res.* 1986, 9, 153; *Chem. Abstr.* 1988, 108, 22095 k).

NEW COMPOUNDS**Phytolaccagenin A** $R, R'' = \text{OH}, R' = \text{OAc}, R''' = \text{H}, R'''' = \text{Me}$ **Acinosolic acid A** $R = \text{OH}, R' = \text{OAc}, R'', R'''' = \text{H}, R''' = \text{Me}$ **Acinosolic acid B** $R = \text{OAc}, R' = \text{OH}, R'', R'''' = \text{H}, R''' = \text{Me}$

PICEA (Pinaceae)

P. abies (L.) Karst. syn. *Abies excelsa* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 498).

Isolation of three glucosides of procyanidin polymers from bark (*Phytochemistry* 1985, 24, 567); piceol (p-hydroxyacetophenone) and picein (p-hydroxyacetophenone glucoside) isolated from shoots (*Pharmazie* 1986, 41, 138; *Chem. Abstr.* 1986, 104, 203919 v); epimanol and derivatives of isopimaradiene and dehydroabietadiene present in needles (*Khim. Pri. Soedin.* 1986, 168; *Chem. Abstr.* 1987, 106, 15705 q); trans-3-methoxy-3',4',5'-trihydroxystilbene, trans-3,4,3',5'-tetrahydroxystilbene, trans-3'- β -glucopyranosyl-4,5'-dihydroxy-3-methoxystilbene and trans-3'- β -glucopyranosyl-3,4,5'-trihydroxystilbene isolated from bark (*Finn. Chem. Lett.* 1987, 14, 43; *Chem. Abstr.* 1988, 108, 109489 r); resin afforded abietinol, dehydroabietinol, palustrol and levopimarinol (*Khim. Pri. Soedin.* 1988, 812; *Chem. Abstr.* 1989, 111, 4244 r).

P. morinda Link; see *P. smithiana* Boiss.

P. smithiana Boiss. syn. *P. morinda* Link

Eng. - West Himalayan spruce; Kash. & Himachal Pradesh - Rai, Rau, Re, Riar, Kachal, Kachhlu, Salla, Tosh; Garhwal & Kumaon - Roi, Rhai, Rogha, Kathela, Kandre.

Amentoflavone, cupressuflavone and agathisflavone isolated from leaves as their hexa-O-methyl ethers (*J. Indian Chem. Soc.* 1985, 62, 788).

Distribution : Himalayas, from Kashmir to Kumaon, alt. 1500-3000 m.

PICRASMA (Simaroubaceae)

P. andamanica Kurz. ex Benn.; see *P. javanica* Blume

P. javanica Blume syn. *P. nepalensis* Benn., *P. andamanica* Kurz ex Benn., *P. javanica* Blume var. *nepalensis* (Benn.) Badhwar (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, . 192).

Isolation of crenatine, crenatidine, canthin-6-one, 1-ethyl- β -carboline, picrasidine I, picrasidine J and picrasidine T from bark (*Shoyakugaku Zasshi* 1987, 41, 338; *Chem. Abstr.* 1988, 109, 11618 c); two new alkaloids - 5-hydroxydehydrocrenatine and 5-hydroxycrenatine - isolated and characterised as 1-ethenyl-4-methoxy-9H-pyrido[3,4-b]indol-5-ol and 1-ethyl-4-methoxy-9H-pyrido[3,4-b]indol-5-ol respectively; crenatine and dehydrocrenatine also isolated (*Aust. J. Chem.* 1987, 40, 1527).

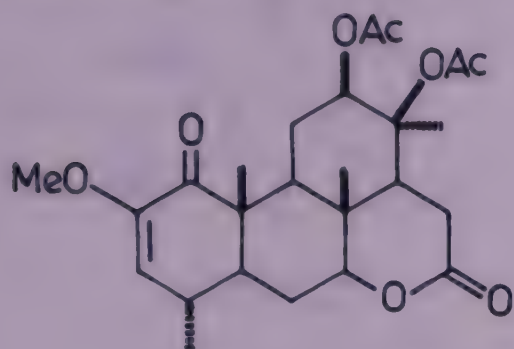
P. javanica Blume var. *nepalensis* (Benn.) Badhwar; see *P. javanica* Blume

P. nepalensis Benn.; see *P. javanica* Blume

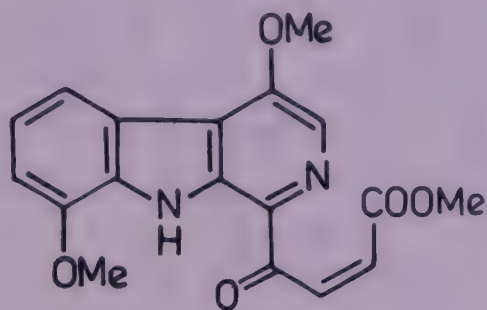
P. quassioides (D.Don) Benn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 499).

Picrasins A, B, C, D, E, F and G isolated from wood of Japanese plant and their stereostructures determined (*Phytochemistry* 1975, 14, 2473; *Senshokutai* 1986, 38, 1179; *Chem. Abstr.* 1986, 105, 72199 f); a new quassinoid - kusulactone - isolated from stem and its structure determined; nagakilactone F and β -sitosterol also isolated (*Zhongcaoyao* 1984, 15, 531; *Chem. Abstr.* 1985, 102, 163674 m); determination of 4,5-dimethoxy- β -canthin-6-one (0.096), 1-carbomethoxy- β -carboline (0.067), 1-carboethoxy- β -carboline (0.011) and 1-vinyl-4,8-dimethoxy- β -carboline (0.008%) in stem by HPLC (*Yaowu Fenxi Zazhi* 1985, 5, 11; *Chem. Abstr.* 1985, 102, 191225 j); isolation of a new β -carboline alkaloid - picrasidine E - from wood and its characterisation; 4,5-dimethoxycanthin-6-one, β -carboline-1-propionic acid, 1-ethoxycarbonyl- β -carboline, 1-formyl- β -carboline, 1-hydroxymethyl- β -carboline, 5-hydroxy-4-methoxycanthin-6-one and 1-methoxycarbonyl- β -carboline also isolated (*Chem. Pharm. Bull.* 1984, 32, 3579); isolation and characterisation of picrasinoside A and picrasinoside B (*Senshokutai* 1986, 38, 1179; *Chem. Abstr.* 1986, 105, 72199 f); a new dimeric β -carboline alkaloid - picrasidine F - isolated from root bark and its crystal structure determined (*Chem. Pharm. Bull.* 1986, 34, 3228); isolation of two dimeric alkaloids - picrasidine G and picrasidine S - from root bark and their structure elucidation (*Chem. Pharm. Bull.* 1987, 35, 3305); more dimeric alkaloids - picrasidine H and picrasidine R - obtained from root bark and characterised (*Chem. Pharm. Bull.* 1986, 34, 2090); picrasidine I, picrasidine J and picrasidine K isolated from bark and their structures established (*Chem. Pharm. Bull.* 1985, 33, 3356); isolation and structure determination of picrasidine M and picrasidine P from root bark; structure of picrasidine L (3-methylcanthin-2,6-dione) revised to 3-methylcanthin-5,6-dione (*Chem. Pharm. Bull.* 1985, 33, 3847); isolation of picrasidine N, picrasidine O and picrasidine Q from wood and their structure elucidation (*Chem. Pharm. Bull.* 1985, 33, 4901); picrasidine T isolated from bark and its structure determined (*Phytochemistry* 1987, 26, 3375); another dimeric alkaloid - picrasidine U - obtained from root wood and its structure established (*Phytochemistry* 1988, 27, 3029); two more new dimeric β -carboline alkaloids - kumujansine and kumujantine - isolated from heartwood and characterised (*Yaoxue Xuebao* 1988, 23, 267; *Chem. Abstr.* 1988, 109, 107726 n); six new 7,24-tirucalladiene derivatives isolated from twigs and characterised as 24(Z)27-hydroxy-3-oxo-7,24-tirucalladien-21-al (I), 24(Z)27-hydroxy-7,24-tirucalladien-3-one (II), 24(Z)3 α -oxo-3 α -homo-27-hydroxy-7,24-tirucalladien-3-one (III), 24(Z)27-hydroxy-3-oxo-7,24-tirucalladien-21-oate (IV), 24(Z)3 β ,27-dihydroxy-7,24-tirucalladien-21-al (V) and 24(Z)7,24-tirucalladien-3 β ,27-diol (VI) by ¹³C-NMR studies; masticadienediol also isolated (*Chem. Pharm. Bull.* 1989, 37, 57).

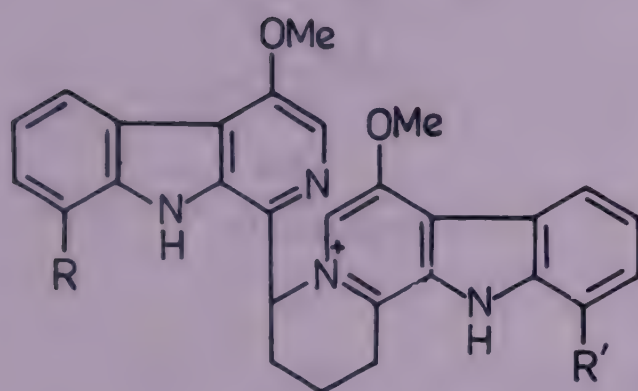
NEW COMPOUNDS



Kusulactone



Picrasidine E



Picrasidine F

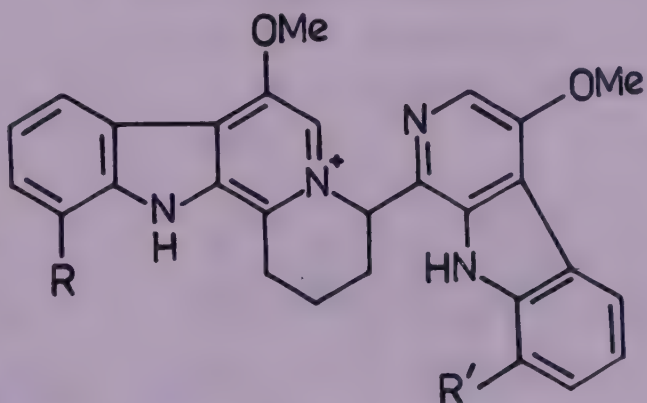
R = OMe, R' = H

Kamujansine

R, R' = H

Kamujantine

R, R' = OMe



Picrasidine G

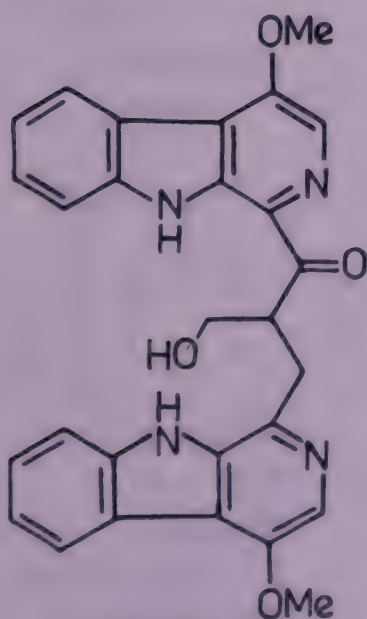
R, R' = H

Picrasidine S

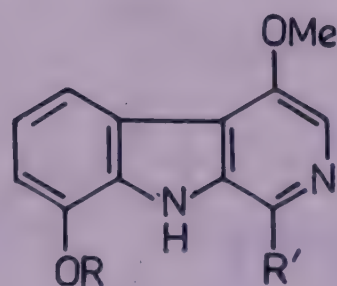
R, R' = OMe

Picrasidine T

R, R' = OH



Picrasidine H



Picrasidine I

R = H, R' = CH=CH₂

Picrasidine J

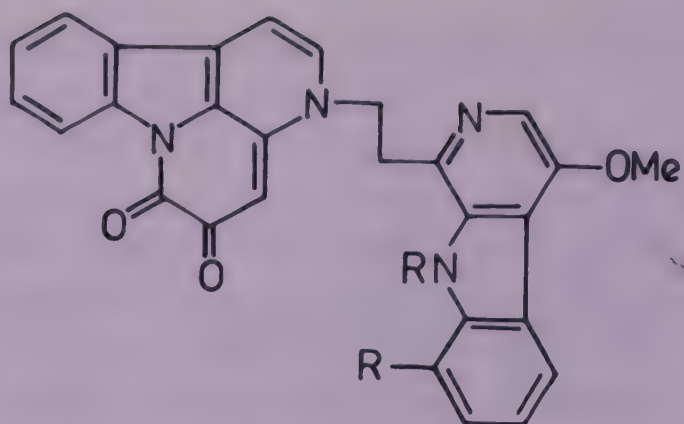
R = H, R' = Et

Picrasidine K

R = H, R' = CH₂CH₂NEt₂

Picrasidine P

R = Me, R' = H

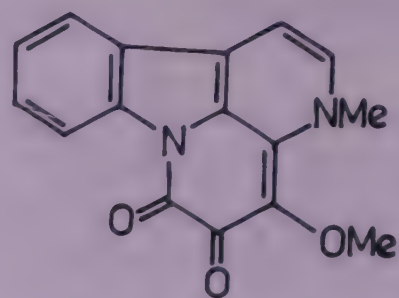


Picrasidine M

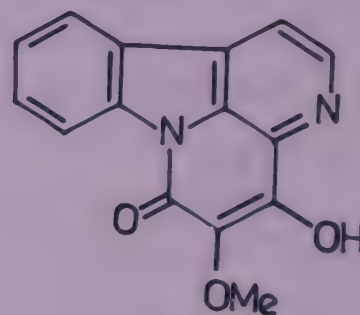
R = H, R' = OMe

Picrasidine N

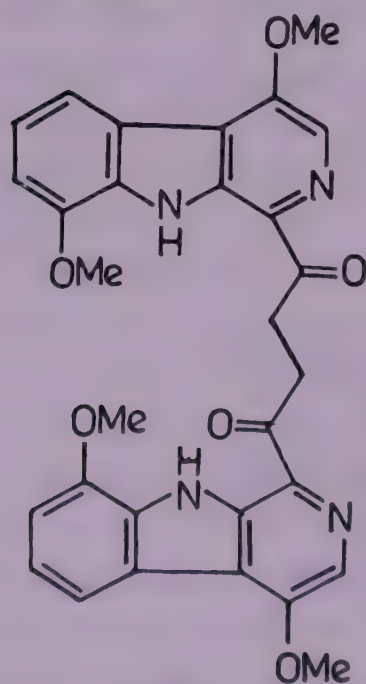
R = OMe, R' = H



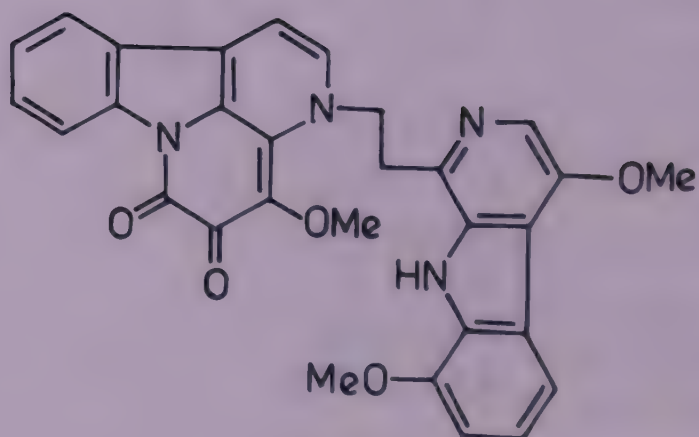
Picrasidine O



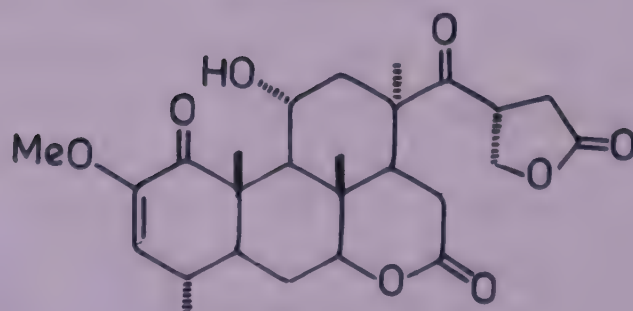
Picrasidine Q



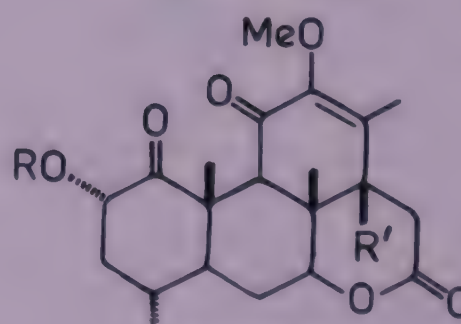
Picrasidine R



Picrasidine U



Picrasin A



Picrasin B

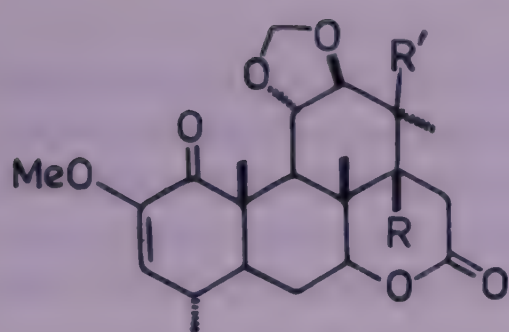
R, R' = H

Picrasin G

R = H, R' = OH

Picrasinoside A

R = Glu, R' = H



Picrasin D

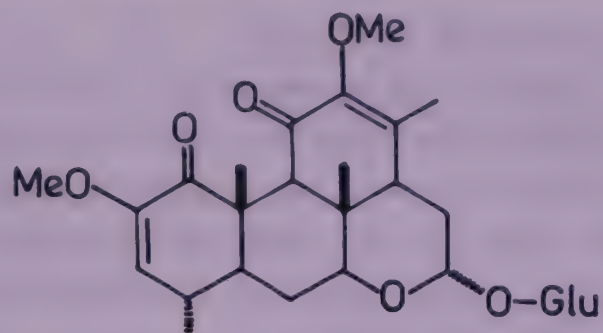
$R, R' = H$

Picrasin E

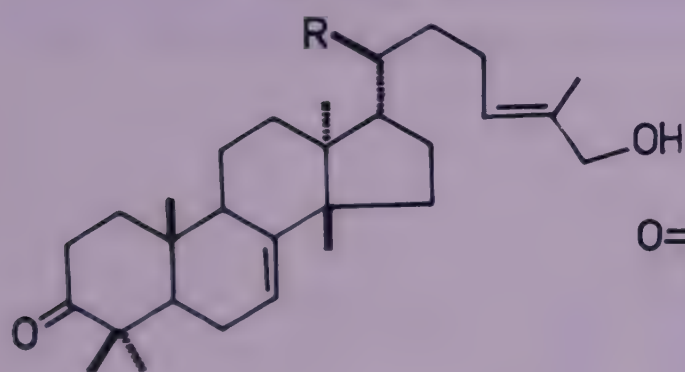
$R = OH, R' = H$

Picrasin F

$R, R' = OH$



Picrasinoside B



I

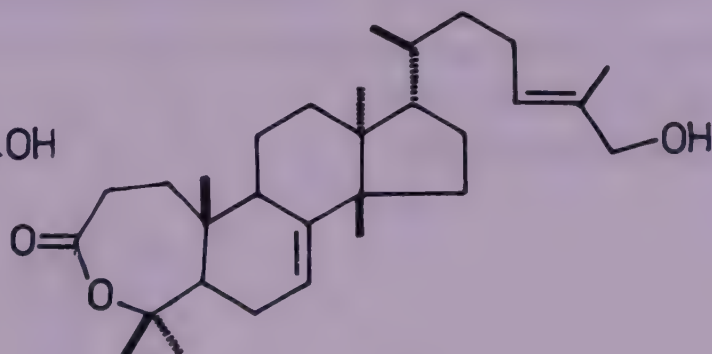
$R = CHO$

II

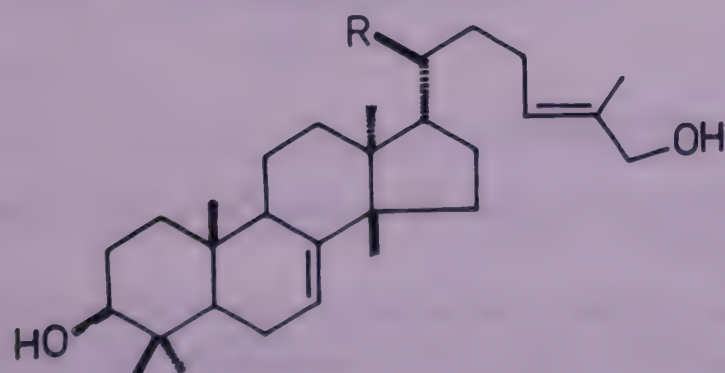
$R = Me$

IV

$R = COOMe$



III



V

$R = CHO$

VI

$R = Me$

BIOLOGICAL ACTIVITY

Canthin-6-one increased rate of blood flow of both intestine and stomach whereas 4,5-dimethoxycanthin-6-one, 5-hydroxy-4-methoxycanthin-6-one and 1-methoxycarbonyl- β -carboline increased rate of intestinal blood flow only (*Shoyakugaku Zasshi* 1985, 39, 28; *Chem. Abstr.* 1985, 103, 206469 p); picrasinoside B inhibited tumor growth but activity was less than that of 5-FU; picrasin B promoted tumor growth (*Senshokutai* 1986, 38, 1179; *Chem. Abstr.* 1986, 105, 72199 f).

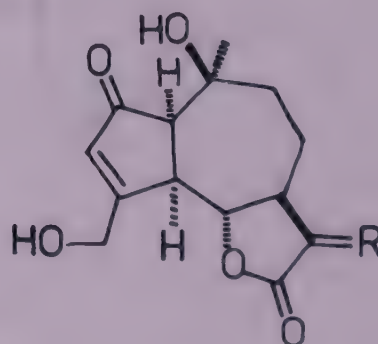
PICRIS (Asteraceae)

P. hieracioides L.; see *P. hieracioides* L. ssp. *kaimaensis* Kitamura

P. hieracioides L. ssp. *kaimaensis* Kitamura syn. *P. hieracioides* sensu Hook.f. (non L.) (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 535).

Two new sesquiterpene lactones - hieracin I and hieracin II - isolated from flowers along with jacquilenin and 8-deoxylactucin; structures of new compounds determined (*Bull. Chem. Soc. Jpn.* 1988, 61, 2971).

NEW COMPOUNDS



Hieracin I

R = α -Me, β -H

Hieracin II

R = CH₂

PICRORHIZA (Scrophulariaceae)

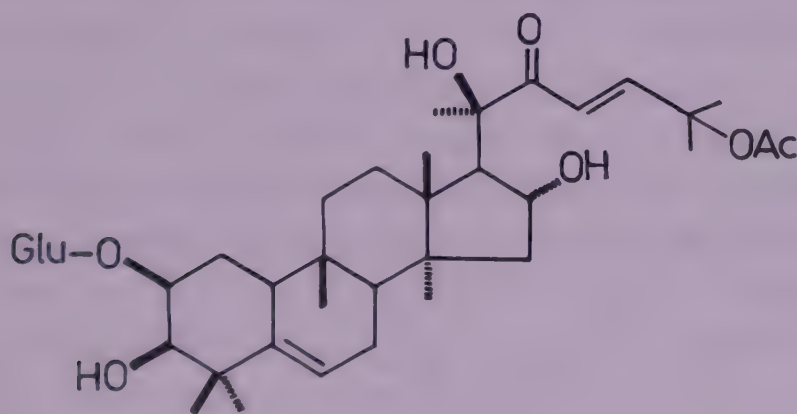
P. kurrooa Royle ex Benth. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 536).

Alcoholic extract decreased alkaline phosphatase, SGOT, SGPT and thymol turbidity. It increased significantly body weight of rats, concomitantly DNA and RNA concentrations in liver were found to be elevated significantly (*J. Res. Ayurveda & Siddha* 1980, 1, 77); root and rhizome extract exhibited hepatoprotective activity in rat and mastomys. Active principle identified as kutkin and kutkin-free fraction found to be devoid of any activity (*Indian J. Med.*

Res. 1988, 87, 401); oral administration of plant extract to guinea pigs before or after vaccination markedly reduced rise in body temperature, loss in body weight, food intake and mortality induced by vaccinia virus. The drugs may be acting directly as virucide because it prevented many effects of virus when administered after vaccination (*J. Res. Ayurveda & Siddha* 1982, 3, 162); plant extract suppressed inflammatory oedema at 1 hr, 3 hr and 5 hr post-insult in rats. Macrophage depletion in animals did not affect anti-inflammatory effect of the extract. Neutrophil depletion significantly inhibited carrageenin-inflammation assayed 3 hr after insult. Mast cell depletion counteracted anti-inflammatory effect of extract at 1 hr post-insult, but significant activity was apparent at 3 hr (*Indian J. Physiol. Pharmacol.* 1988, 32, 289).

A new cucurbitacin glycoside isolated from roots and characterised as 25-acetoxy-2-O- β -glucosyl-3,16,20-trihydroxy-9-methyl-19-norlanosta-5,23-dien-22-one (I); picroside I and picroside II also isolated (*Phytochemistry* 1985, 24, 2659).

NEW COMPOUNDS



I

BIOLOGICAL ACTIVITY

Kutkin showed significant hepatoprotective activity in hepatic damage induced by galactosamine in rats and mastomys (*Indian J. Med. Res.* 1988, 87, 401).

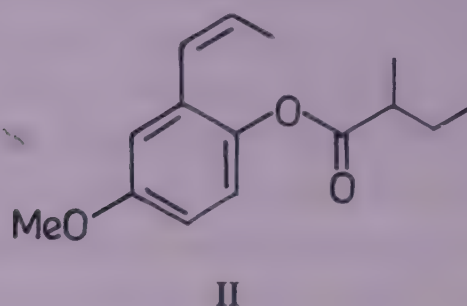
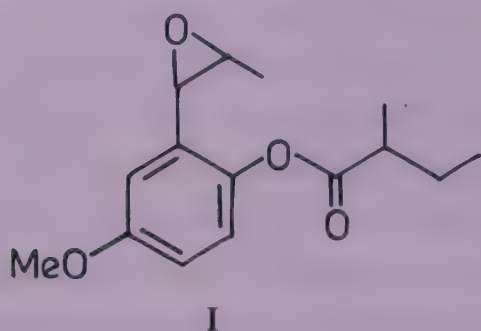
PIMPINELLA (Apiaceae)

P. achilleifolia (DC.) Clarke; see *Vicatia achilleifolia* (DC.) P.K. Mukh.

P. anisum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 501).

4-O- β -D-Glucosylbenzoic acid isolated from seeds (*Phytochemistry* 1984, 23, 1811); two phenylpropenyl esters (I and II) isolated from seeds and their structures determined (*J. Nat. Prod.* 1988, 51, 249).

NEW COMPOUNDS



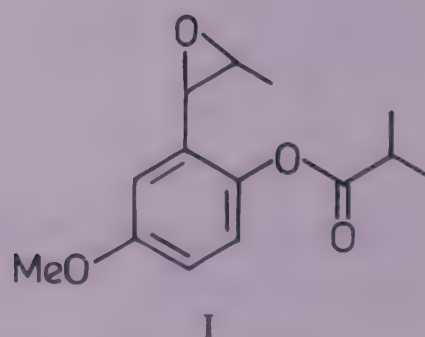
BIOLOGICAL ACTIVITY

Phenylpropenyl ester (I) inhibited germination of *Abutilon theophrasti*, *Lolium multiflorum*, *Daucus carota*, *Lactuca sativa* and *Lycopersicon esculentum* (*J. Nat. Prod.* 1988, 51, 249).

P. diversifolia DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 537).

Identification of (+)(Z)2-methyl-2-butenate and (+)isobutyrate esters of 4-methoxy-2-[(E)3-methyloxiranyl]phenol as major components in root essential oil (*Phytochemistry* 1986, 25, 207); a new phenylpropenyl ester (I) along with known phenylpropenyl ester (I, described under *P. anisum*) isolated from seeds of Pakistani plant and its structure elucidated (*J. Nat. Prod.* 1988, 51, 249); angelate-isobutyrate and diangelate esters of 2-[(E)3-methoxyoxiranyl]hydroquinone identified in root essential oil (*Phytochemistry* 1989, 28, 1531).

NEW COMPOUNDS



BIOLOGICAL ACTIVITY

Phenylpropenyl ester (I) at 1.0 mM completely inhibited germination of carrot and ryegrass seeds and at 0.1 mM caused 50.0% inhibition of germination of lettuce seeds (*J. Nat. Prod.* 1988, 51, 249).

PINUS (Pinaceae)

P. excelsa Wall. ex D.Don; see *P. wallichiana* A.B. Jackson

P. griffithi M.clell.; see *P. wallichiana* A.B. Jackson

P. insularis Endl. syn. *P. khasya* Royle (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 193).

α -Pinene (59.36), β -pinene (31.20) and longifolene (0.78%) determined in oleoresin of plant grown in Arunachal Pradesh (*Indian For.* 1986, 112, 734; *Chem. Abstr.* 1987, 106, 176677 x).

P. khasya Royle; see *P. insularis* Endl.

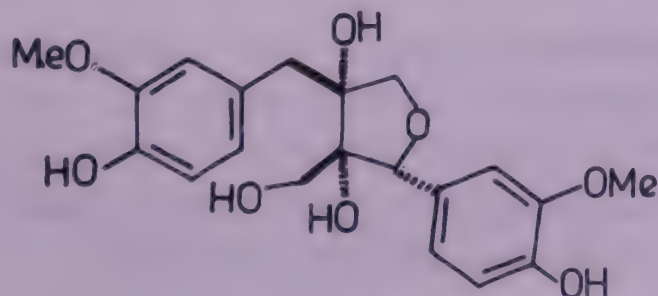
P. longifolia Roxb.; see *P. roxburghii* Sargent

P. massoniana Lamb.

Eng. - Masson's pine.

Isolation and characterisation of three new flavonoid glycosides - 6-C-methylaromadendrin-7-O- β -D-glucopyranoside, taxifolin-3'-O- β -D-(6''-O-phenylacetyl)-glucopyranoside and eriodictyol-3'-O- β -D-glucopyranoside - from needles; taxifolin, its 3'-O- β -D-glucoside, (+)catechin and naringenin-7-O- β -D-glucoside also isolated (*Phytochemistry* 1985, 24, 155); a new lignan - (-)massoniresinol - isolated from needles and its structure and absolute configuration determined (*Phytochemistry* 1985, 24, 364); seventeen di-lignol glycosides isolated from needles and identified as two α -L-rhamnopyranosides of 2,3-dihydro-2-(4'-hydroxy-3'-methoxyphenyl)-3-hydroxymethyl-7-methoxy-5-benzofuranpropanol, two α -L-rhamnopyranosides and β -D-glucopyranoside of 2,3-dihydro-7-hydroxy-2-(4'-hydroxy-3'-methoxyphenyl)-3-hydroxymethyl-5-benzofuranpropanol, a α -L-rhamnopyranoside, two β -D-glucopyranosides and a β -D-xylopyranoside of 1-(4'-hydroxy-3'-methoxyphenyl)-2-[2''-hydroxy-4''-(3-hydroxypropyl)phenoxy]-1,3-propanediol, a α -L-rhamnopyranoside and a β -D-glucopyranoside of 1-(4'-hydroxy-3'-methoxyphenyl)-2-[4''-(3-hydroxypropyl)-2''-methoxyphenoxy]-1,3-propanediol, a β -D-xylopyranoside, a β -D-glucopyranoside and a α -L-arabinofuranoside of (+)isolariciresinol, a β -D-glucopyranoside and β -D-xylopyranoside of (-)secoisolariciresinol and a β -D-glucopyranoside of (+)pinoresinol; two arylglycerols - 1-(4-hydroxyphenyl)-1,2,3-propanetriol and 1-(4-hydroxy-3-methoxyphenyl)-1,2,3-propanetriol - also isolated (*Acta Chem. Scand.* 1985, 39B, 241); isolation of 12 β ,18-dihydroxypimara-8(14),15-diene from resin (*Holzforschung* 1986, 40, 289; *Chem. Abstr.* 1987, 107, 74248 m). Distribution : Native of China, introduced into India in Himachal Pradesh.

NEW COMPOUNDS



(-)*Massoniresinol*

P. merkusii Jungh. & De Vriese (*merkussii*)

Determination of α -pinene (42.26) and borneol (7.40%) in essential oil (0.75%) of needles (*FPRDI J.* 1984, 13, 52; *Chem. Abstr.* 1985, 103, 220583 c); α -pinene (57.05) and car-3-ene (39.35%) estimated in oil (*Indian For.* 1986, 112, 734; *Chem. Abstr.* 1987, 106, 176677 x). Distribution : Arunachal Pradesh.

P. pinaster Ait. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 502).

α -Pinene (90.0 and 77.0%) determined in oil of needles and bark respectively (*Rastit. Resur.* 1985, 21, 130; *Chem. Abstr.* 1985, 103, 42379 f).

P. roxburghii Sargent syn. *P. longifolia* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 502).

Enantiospecific synthesis of longifolene (*Chem. Commun.* 1986, 1691); two unidentified termite repellent compounds isolated from needles (*Indian J. Zool.* 1986, 14, 43; *Chem. Abstr.* 1988, 109, 20270 k); turpentine from xylem resin contained α -pinene, β -pinene, car-3-ene, abietic acid and isopimaric acid (*Phytochemistry* 1988, 27, 2873).

P. wallichiana A.B. Jackson syn. *P. griffithii* M.clell., *P. excelsa* Wall. ex D.Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 193).

Turpentine from xylem resin contained α -pinene (90.0) and isomers of undecane, dodecane and tridecane as minor constituents along with abietic, isopimaric and lambertianic acids (*Phytochemistry* 1988, 27, 2873).

PIPER (Piperaceae)*P. argyrophyllum* Miq.

Piperine and N-isobutyloctadeca-2E,4E-dienamide isolated (*Indian J. Chem.* 1988, 27B, 163).

Distribution : Peninsular India.

P. aurantiacum Wall. ex Hook.f.; see *P. wallichii* (Miq.) Hand.-Mazz.

P. betle L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 502).

Chavibetol (53.1), chavibetol acetate (15.5), caryophyllene (3.79), allylpyrocatechol diacetate (0.71), camphene (0.48), chavibetol methyl ether (0.48), eugenol (0.32), α -pinene (0.21), β -pinene (0.21), α -limonene (0.14), safrole (0.11), 1,8-cineole (0.04), p-cymene (0.11) and allylpyrocatechol monoacetate determined in leaf oil of plant grown in Philippines (*Arch. Pharmacol Res.* 1986, 9, 93; *Chem. Abstr.* 1987, 106, 38203 p).

P. brachystachyum Wall. ex Hook.f.; see *P. mullesua* D. Don

P. chaba Blume; see *P. retrofractum* Vahl

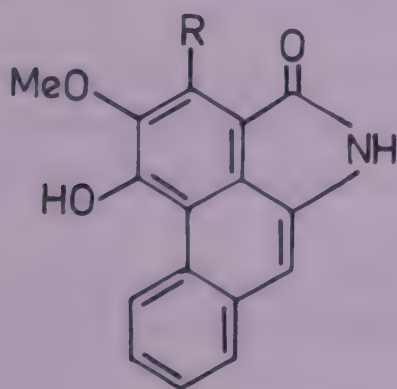
P. cubeba L.f. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 538).

(-)-Clusin, (-)-cubebin, (-)-dihydrocubebin, (-)-hinokinin and (2R,3R)-2-(3'',4'',5''-trimethoxybenzyl)-3-(3',4'-methylenedioxybenzyl)-1,4-butanediol isolated (*Phytochemistry* 1985, 24, 329); α -ethoxycubebin, β -ethoxycubebin, dihydrocubebin monoacetate, heterotropan, magnosalin, 5''-methoxyhinokinin and 2,4,5-trimethoxybenzaldehyde isolated (*Phytochemistry* 1987, 26, 2033).

P. longum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 503).

Determination of piperine (3.18%) by HPLC (Yaowu Fenxi Zazhi 1986, 6, 346; *Chem. Abstr.* 1987, 106, 99439 s); three new alkaloids - piperolactam A, piperolactam B and piperadione - isolated from roots and characterised as 10-amino-4-hydroxy-3-methoxyphenanthrene-1-carboxylic acid lactam, 10-amino-4-hydroxy-2,3-dimethoxyphenanthrene-1-carboxylic acid lactam and 2-hydroxy-1-methoxy-6-methyl-4H-dibenzo[de,g]quinoline-4,5(6H)-dione respectively; aristolactam A, cepharadione A, cepharadione B, cepharanone B, norcepharadione B and 2-hydroxy-1-methoxy-4H-dibenzo[de,g]quinoline-4,5-(6H)-dione also isolated (*Phytochemistry* 1988, 27, 1511); a new isobutylamide - longamide - isolated and characterised along with guineensine, pluviatilol and methyl pluviatilol (*Phytochemistry* 1988, 27, 3523).

NEW COMPOUNDS

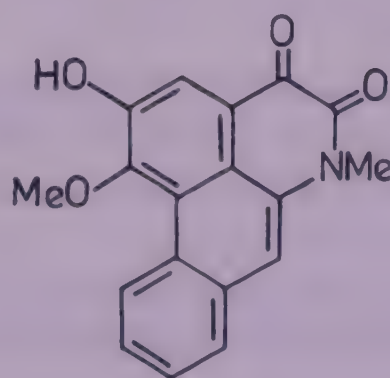


Piperolactam A

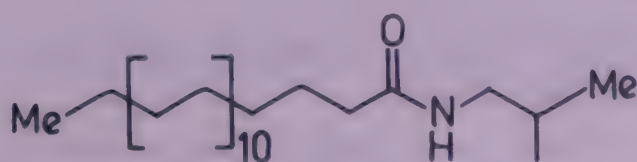
R = H

Piperolactam B

R = OMe



Piperadione

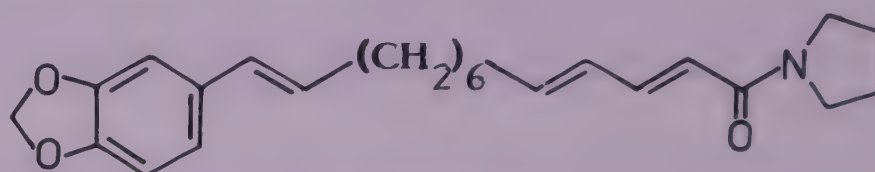


Longamide

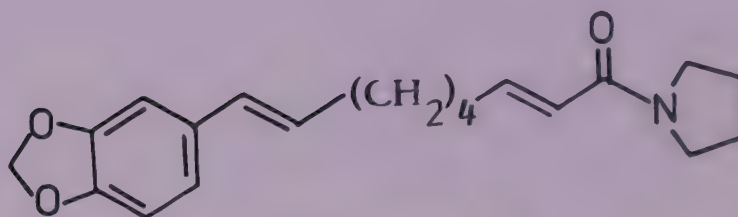
P. mullesua D.Don syn. *P. brachystachyum* Wall. ex Hook.f. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 539).

Isolation and structure determination of three new pyrrolidides - brachyamide A, brachyamide B and brachystine - along with asarinin, guineensine, pipataline, pluviatilol, methyl pluviatilol, sesamine, sitosterol, retrofractamide A and piperide (retrofractamide B) (*Phytochemistry* 1988, 27, 3523).

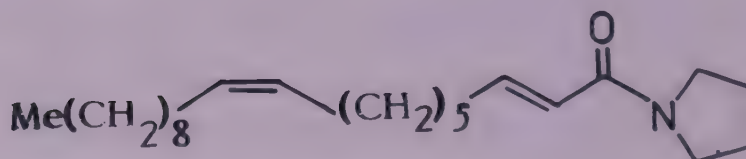
NEW COMPOUNDS



Brachyamide A



Brachyamide B



Brachystine

P. nigrum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 503).

Piperine isolated (*Kenkyu Kiyo-Tokyo Kasei Daigaku* 1985, 25, 201; *Chem. Abstr.* 1987, 106, 38300 t); isolation of (-)-cubelin, (-)-3,4-dimethoxy-3,4-desmethylenedioxcubelin and (-)-3',4'-dimethoxy-3',4'-desmethylenedioxcubelin from leaves (*Indian J. Chem.* 1988, 27B, 388).

BIOLOGICAL ACTIVITY

Piperine exhibited antibacterial and antitumor activities against *Pseudomonas aeruginosa* and *Alcaligenes F2518* (*Kenkyu Kiyo-Tokyo Kasei Daigaku* 1985, 25, 201; *Chem. Abstr.* 1987, 106, 38300 t).

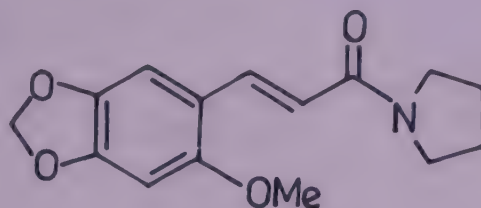
P. officinarum Cas. ex DC.; see *P. retrofractum* Vahl

P. peepuloides Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 504).

A new cinnamoylpyrrolidine amide (I) isolated from leaves and characterised as (Z)pyrrolidine-1,3-(6-methoxy-1,3-benzodioxol-5-yl)-1-oxo-2-propenyl; peepuloidine, 2-

methoxy-4,5-methylenedioxy-Z-cinnamoylpiperidide, β -sitosterol and its glucoside also isolated (*Phytochemistry* 1986, 25, 1997).

NEW COMPOUNDS

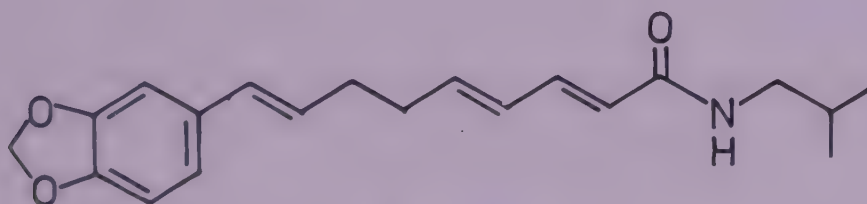


I

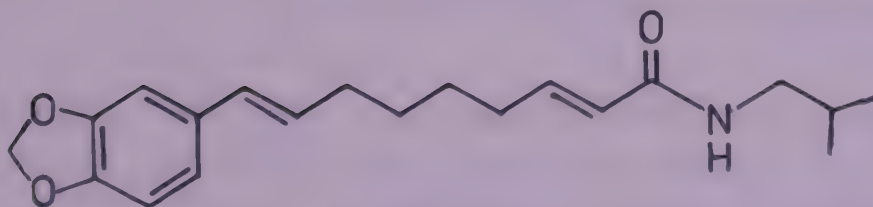
P. retrofractum Vahl syn. *P. chaba* Hunter (non Blume), *P. officinarum* Cas. ex DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 504).

Two new unsaturated amides - retrofractamide A and retrofractamide C - along with retrofractamide B (pipericide) and retrofractamide D (10(E) isomer of pipericide) isolated from aerial parts and characterised; sesamin and 3,4,5-trimethoxydihydrocinnamic acid also isolated (*Phytochemistry* 1985, 24, 279).

NEW COMPOUNDS



Retrofractamide A

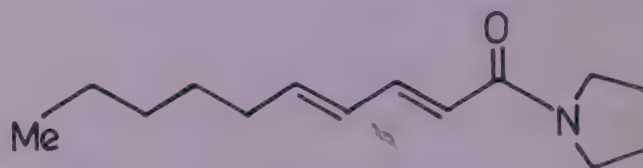


Retrofractamide C

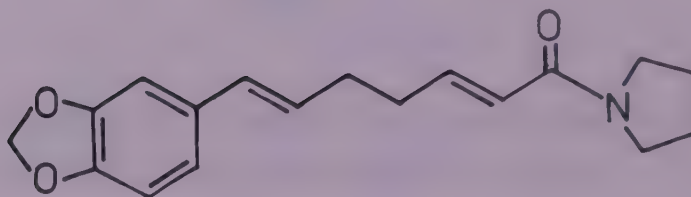
P. sarmentosum Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 505).

Isolation and structure determination of 1-(3,4-methylenedioxyphenyl)-1(E)tetradecene, N-(3-phenylpropanoyl)pyrrole, sarmentine and sarmentosine from fruits of plant from Thailand; pallitorine and β -sitosterol also isolated (*Tetrahedron* 1987, 43, 3689); α -asarone and asaronaldehyde isolated from fruits of plant grown in Thailand (*J. Sci. Soc. Thailand* 1988, 14, 77; *Chem. Abstr.* 1988, 109, 226710 n).

NEW COMPOUNDS



Sarmentine

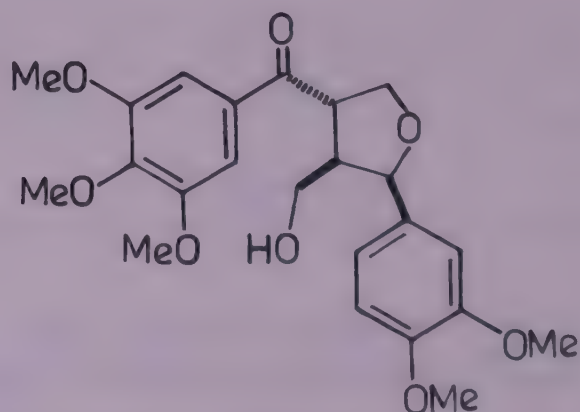


Sarmentosine

P. sylvaticum Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 505).

A new lignan - sylvone - isolated from seeds and its structure established (*Tetrahedron* 1984, 40, 5047).

NEW COMPOUNDS

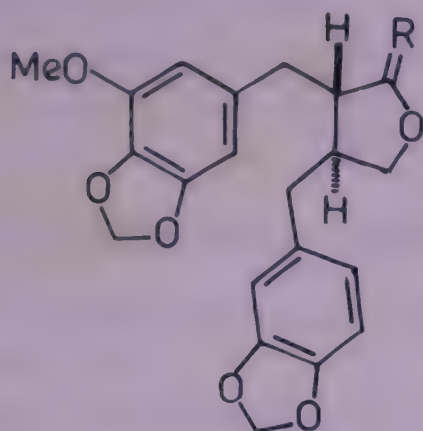


Sylvone

P. trichostachyon (Miq.) DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 541).

Three new lignans - trichostin, dehydrotrichostin and dihydrotrichostin - isolated along with (-)-cubebin, (-)-dihydrocubebin and (-)-hinokinin; structures of new compounds determined (*Phytochemistry* 1988, 27, 1479).

NEW COMPOUNDS

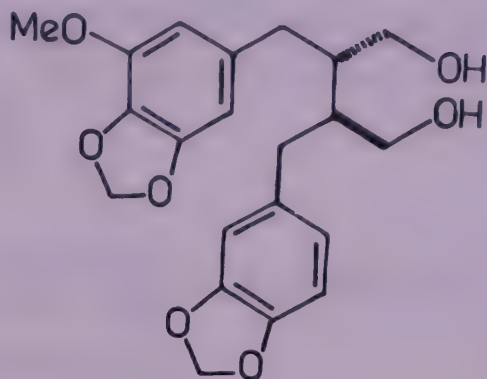


Trichostin

R = OH, H

Dehydrotrichostin

R = O



Dihydrotrichostin

P. wallichii (Miq.) Hand.-Mazz. syn. *P. aurantiacum* Wall. ex Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 506).

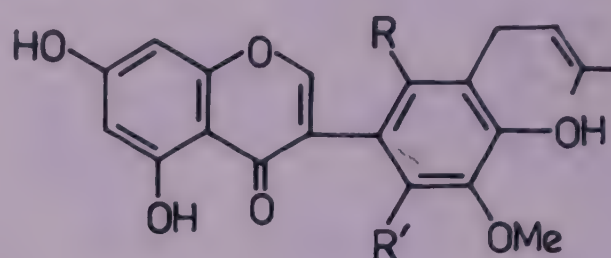
δ -Cadinene, α -caryophyllene alcohol, β -caryophyllene, β -elemene, β -eudesmol, guaiacol, (E) and (Z)isoelemicins, limonene, β -maaliene, γ -muurolene, (E)nerolidol, β -ocimene, α - and β -patchoulenes, α -phellandrene, α -pinene, sabinene, β -selinene, spathulenol and terpinen-4-ol found to be present in essential oil (Youji Huaxue 1988, 8, 78; *Chem. Abstr.* 1988, 108, 192582 j).

PISCIDIA (Papilionaceae)

P. erythrina L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 542).

Two new prenylated isoflavones - 2'-deoxypiscerythron and 6'-prenylpiscerythron - isolated from root bark and characterised (*Phytochemistry* 1984, 23, 2945, 2976); piscidone isolated from bark (*Phytochemistry* 1984, 23, 2976; *Prog. Clin. Biol. Res.* 1988, 280, 365; *Chem. Abstr.* 1989, 110, 4690 o); isolation of 8-prenylpinocembrin and 5,7,4'-trihydroxy-3',5'-diisopent-2-enylisoflavone from roots (*Phytochemistry* 1986, 25, 1505); bark yielded 5,7,2',4'-tetrahydroxy-5'-methoxy-3',6'-diisoprenylisoflavone (*Prog. Clin. Biol. Res.* 1988, 280, 365; *Chem. Abstr.* 1989, 110, 4690 o).

NEW COMPOUNDS



2-Deoxypiscerythrone

R, R' = H

6'-Prenylpiscerythrone

R = OH, R' = CH₂CH=C(Me)₂

BIOLOGICAL ACTIVITY

Piscidone and 6'-prenylpiscerythrone showed spasmolytic activity against rat uterus contraction (*Prog. Clin. Biol. Res.* 1988, 280, 365; *Chem. Abstr.* 1989, 110, 4690 o).

PISTACIA (Anacardiaceae)

P. chinensis Bunge ssp. *integerrima* (Stewart) Rech.f. syn. *P. integerrima* Stewart (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 195).

Dihydroquercetin, (-)eriodictyol and luteolin isolated (*J. Indian Chem. Soc.* 1985, 62, 261).

P. integerrima Stewart; see *P. chinensis* Bunge ssp. *integerrima* (Stewart) Rech.f.

P. lentiscus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 506).

α -Pinene (64.43-86.38) and myrcene (5.0-25.3%) determined in oil of plant from different districts of Chios Island (*Pharm. Delt. Epistem. Ekdosis* 1984, 10, 17; *Chem. Abstr.* 1985, 103, 42382 b).

PISUM (Papilionaceae)

P. sativum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 507).

Sphingolipids - N-2'-hydroxylignoceroyl-4-hydroxy-8-sphingenine, 1-O-glucosyl-N-2'-hydroxypalmitoyl-8-sphingenine and 1-O-diglucosyl-N-2'-hydroxy behenyl-4-hydroxy-8-sphingenine - isolated from seeds (*Agric. Biol. Chem.* 1985, 49, 539); isolation of allantoin from active fraction (*Khim. Priir. Soedin.* 1985, 420; *Chem. Abstr.* 1985, 103, 51228 h); a glycopeptide composed of sixteen amino acids and two sugars isolated (*F.E.C.S. Int. Conf. Chem. Biotechnol. Biol. Act. Nat. Prod.* 1987, 4, 173; *Chem. Abstr.* 1988, 109, 187348 d).

BIOLOGICAL ACTIVITY

Glycopeptide at 0.06-0.13 mg/ml stimulated growth of wheat coleoptiles by 35%. Glutamate dehydrogenase and nitrate reductase activities were also affected by glycopeptide (*F.E.C.S. Int. Conf. Chem. Biotechnol. Biol. Act. Nat. Prod.* 1987, 4, 173; *Chem. Abstr.* 1988, 109, 187348 d).

PITHECELOBIUM (Mimosaceae)

P. dulce (Roxb.) Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 507).

Dulcitol isolated from leaves (*Indian J. Chem.* 1985, 24B, 453).

PLANTAGO (Plantaginaceae)

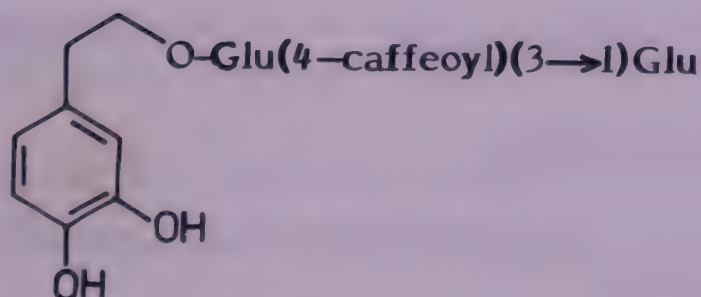
P. asiatica L.; see *P. major* L. ssp. *major*

P. lanceolata L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 545).

Galactose (44.0), arabinose (32.0), glucose (9.0), rhamnose (7.0), mannose (4.0%) along with xylose and fucose obtained by complete hydrolysis of total mucilage (*Dtsch. Apoth. Ztg.* 1985, 125, 58; *Chem. Abstr.* 1985, 102, 182389 p); crude polysaccharide from leaves composed of galacturonic acid (31.0), galactose (28.0), arabinose (20.0), glucuronic acid (7.0), glucose (6.0), rhamnose (4.0), mannose (2.0%), fucose and xylose (*Planta Med.* 1985, 51, 293).

P. major L. ssp. *major* syn. *P. asiatica* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 509).

A phenylpropanoid glycoside - plantamajoside - isolated and characterised as 3,4-dihydroxy- β -phenethyl-O- β -D-glucopyranosyl(1 \rightarrow 3)-4-O-caffeoyl- β -D-glucopyranoside (*Phytochemistry* 1988, 27, 3433).

NEW COMPOUNDS

Plantamajoside

BIOLOGICAL ACTIVITY

Plantamajoside showed antibacterial activity against *Escherichia coli* and *Staphylococcus aureus* (*Phytochemistry* 1988, 27, 3433).

P. ovata Forsk. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 196).

A new fatty acid isolated from seed oil and characterised as 9-oxooctadec-cis-12-enoic acid; 9-hydroxyoctadec-cis-12-enoic acid also isolated (*Phytochemistry* 1987, 26, 3067).

PLECTRANTHUS (Lamiaceae)

P. barbatus Andr.; see *Coleus forskohlii* (Willd.) Briq.

P. coesta Buch.-Ham. ex D.Don; see *P. japonicus* (Burm.f.) Koidz. var. *japonicus*

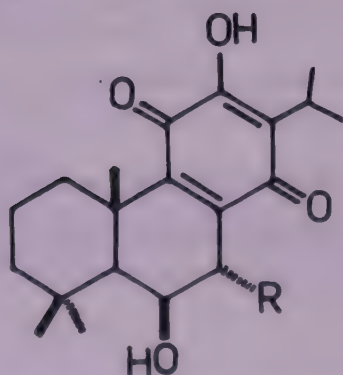
P. fruticosus (DC.) Wight ex Hook.f.

Oil shown to be teratogenic and highly fetotoxic (*Planta Med.* 1986, 52, 486).

7 α -Acetoxy-6 β -hydroxyroyleanone, 6,7-dehydroroyleanone and 7 α ,6 β -dihydroxyroyleanone isolated and their structures determined (*Indian Drugs* 1986, 23, 579); sabinyl acetate (60.0%) obtained from essential oil (*Planta Med.* 1986, 52, 486).

Distribution : Deccan Peninsula.

NEW COMPOUNDS

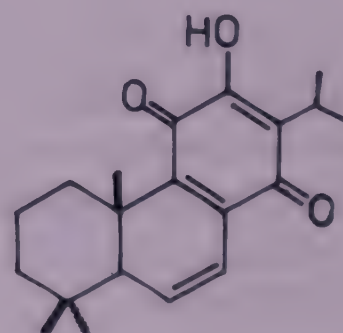


7 α -Acetoxy-6 β -hydroxyroyleanone

R = OAc

7 α ,6 β -Dihydroxyroyleanone

R = OH



6,7-Dehydroroyleanone

P. gerardianus Benth.; see *P. lophanthoides* (Buch.-Ham. ex D.Don) Grierson & Long var. *gerardianus* (Benth.) Bennet

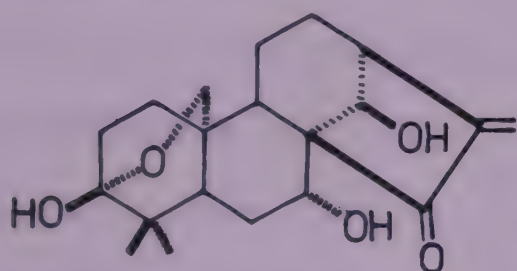
P. incanus Link; see *P. mollis* (Ait.) Spreng.

P. japonicus (Burm.f.) Koidz. var. *japonicus* syn. *P. coesta* Buch.-Ham. ex D.Don, *P. menthoides* Benth., *Rabdosia coetsa* (Buch.-Ham. ex D.Don) Hara

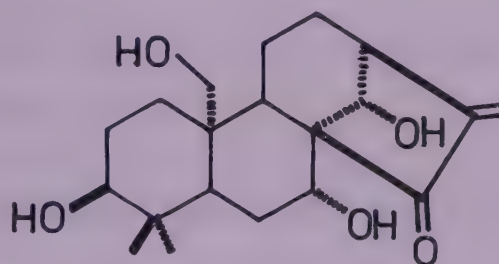
A new ent-kaurene diterpenoid - plecostanol - isolated and its crystal structure determined (*J. Chem. Soc. Perkin 1* 1986, 655); isolation of diterpenoids - coetsin A and coetsin B - from leaves and their structure elucidation by X-ray studies (*Zhiwu Xuebao* 1987, 29, 412; *Chem. Abstr.* 1988, 108, 72105 j); another ent-kaurene diterpenoid - coestanol - isolated along with ent- $3\alpha,7\beta,14\alpha$ -trihydroxykaur-16-en-15-one and characterised (*Indian J. Chem.* 1987, 26B, 15).

Distribution : Throughout western and eastern Himalayas, Meghalaya and hills of south India, alt. 900-2400 m.

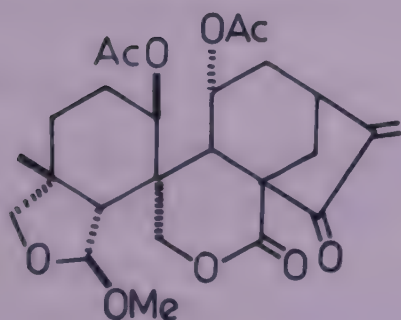
NEW COMPOUNDS



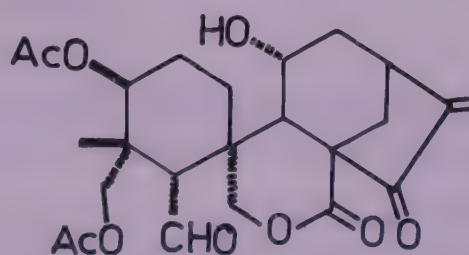
Plecostanol



Coestanol



Coetsin A



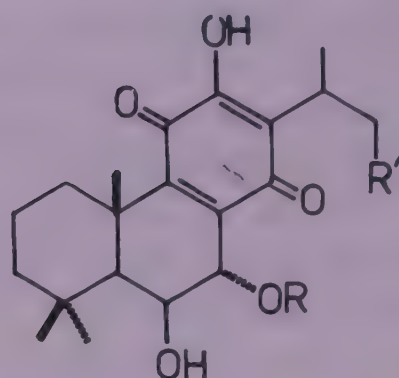
Coetsin B

P. lophanthoides (Buch.-Ham. ex D.Don) Grierson & Long syn. *P. striatus* Benth., *Rabdosia lophanthoides* (Buch.-Ham. ex D.Don) Hara

Isolation and structure determination of six new diterpenoids - lophanthoidins A, B, C, D, E and F - from leaves; enmein, β -sitosterol and stigmasterol also isolated (*Phytochemistry* 1989, 28, 189).

Distribution : Himalayas, Kashmir to Bhutan, alt. 1200-2400 m.

NEW COMPOUNDS



Lophanthoidin A

R = Me, R' = OAc

Lophanthoidin B

R = Ac, R' = OAc

Lophanthoidin C

R = Ac, R' = OH

Lophanthoidin D

R = Et, R' = OH

Lophanthoidin E

R = H, R' = OAc

Lophanthoidin F

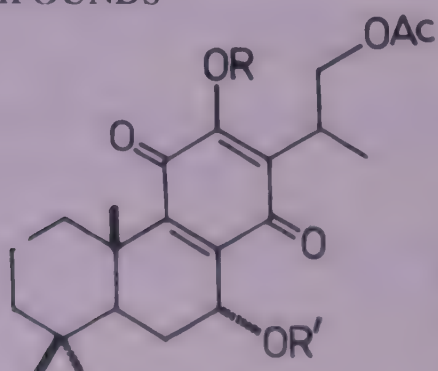
R = Et, R' = OAc

P. lophanthoides (Buch.-Ham. ex D.Don) Grierson & Long var. *gerardianus* (Benth.) Bennet
syn. *P. gerardianus* Benth., *Rabdosia lophanthoides* (Buch.-Ham. ex D.Don) Hara var. *gerardiana*
(Benth.) Hara

Two new abietane quinones - 16-acetoxy-7-O-acetylhorminone and 16-acetoxy-12-O-acetylhorminone - isolated from leaves and their structures elucidated; royleanone, 16-acetoxy-7 α -methoxyroyleanone, 6,7-dchydroroyleanone, horminone, β -sitosterol and stigmast-
sterol also isolated (*Phytochemistry* 1988, 27, 3681).

Distribution : Himalayas, Kashmir to Sikkim, ascending to 3600 m and Khasia Hills, alt.
1200-1800 m.

NEW COMPOUNDS



16-Acetoxy-7-O-acetylhorminone

R = H, R' = Ac

16-Acetoxy-12-O-acetylhorminone

R = Ac, R' = H

P. menthoides Benth.; see *P. japonicus* (Burm.f.) Koidz. var. *japonicus*

P. mollis (Ait.) Spreng. syn. *P. incanus* Link (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 547).

Linoleic (46.5), oleic (21.2), stearic (13.6), palmitic (7.2), vernolic (6.1) and sterculic (3.2%) acids determined in seed oil (*J. Chem. Technol. Biotechnol.* 1989, 45, 143; *Chem. Abstr.* 1989, 111, 93913 y).

P. stracheyi Benth. ex Hook.f. syn. *Rabdosia stracheyi* (Benth. ex Hook.f.) Hara

16-Acetoxy-7 α -methoxyroyleanone, 6,7-dehydroroyleanone and β -sitosterol isolated from leaves and stems (*Yaoxue Xuebao* 1987, 22, 269; *Chem. Abstr.* 1987, 107, 93499 k).

Distribution : Kumaon Himalayas, alt. 1500 m.

P. striatus Benth.; see *P. lophanthoides* (Buch.-Ham. ex D.Don) Grierson & Long

PLEIOSPERMIUM (Rutaceae)

P. alatum (Wall. ex Wt. & Arn.) Swingle; see *Naringi alata* (Wall. ex Wt. & Arn.) Ellis

PLEOPELTIS (Polypodiaceae)

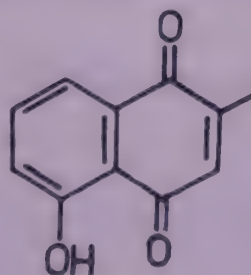
P. hemionitidea (Wall. ex Mett.) Moore; see *Colysis hemionitidea* (Wall. ex Mett.) Presl

PLUMBAGO (Plumbaginaceae)

P. auriculata Lamk. syn. *P. capensis* Thunb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 512).

Crystal structure of plumbagin (*Acta Crystallogr., Cryst. Struct. Commun.* 1987, 43C, 237; *Chem. Abstr.* 1988, 109, 54561 w); apigenin, luteolin and their 7-O-glucosides, α -amyrin, β -amyrin, palmitic acid and β -sitosterol isolated from leaves whereas azalein, azaleatin and capensinidin-3-rhamnoside obtained from flowers (*Bull. Fac. Pharm.* 1987, 25, 81; *Chem. Abstr.* 1988, 109, 115923 q).

NEW COMPOUNDS



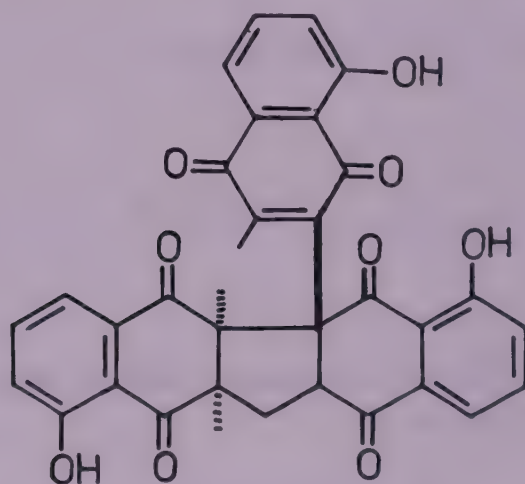
Plumbagin

P. capensis Thunb.; see *P. auriculata* Lamk.

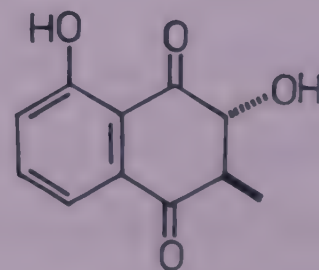
P. zeylanica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 512).

A new trimer of plumbagin - plumbazeylanone - isolated and its structure determined (*Tetrahedron Lett.* 1984, 25, 4801); isolation of a new dihydronaphthoquinone - dihydroserone - and its structure elucidation (*Chem. Ind.* 1986, 823); aspartic acid (9.9), tryptophan (9.7), tyrosine (4.5), threonine (4.1), alanine (3.5), histidine (3.4), glycine (1.7), methionine (0.5) and hydroxyproline (0.2%) determined in aerial parts (*J. Indian Chem. Soc.* 1987, 64, 261); a new naphthoquinone - methylene-3,3'-diplumbagin - isolated from roots of Sri Lankan plant along with chitranone, maritinone, 2-methylnaphthazarin, plumbazeylanone and zeylanone (*J. Chem. Soc. Perkin 1* 1988, 407).

NEW COMPOUNDS



Plumbazeylanone



Dihydroserone

PLUMERIA (Apocynaceae)

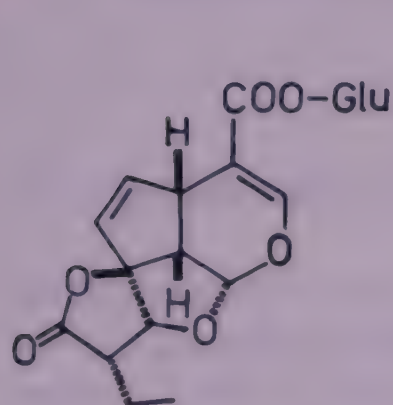
P. acuminata Ait.; see *P. rubra* L. forma *acuminata* (Ait.) Sant. & Irani ex Shah

P. acutifolia Poir.; see *P. rubra* L. forma *acuminata* (Ait.) Sant. & Irani ex Shah

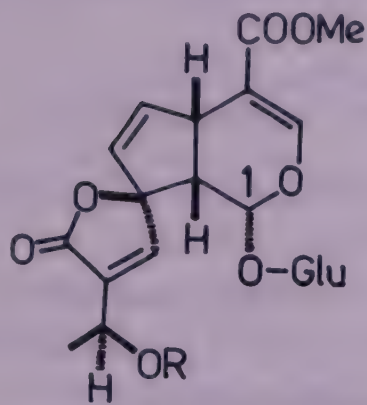
P. rubra L. forma *acuminata* (Ait.) Sant. & Irani ex Shah syn. *P. rubra* L. var. *acutifolia* Bailey, *P. acuminata* Ait., *P. acutifolia* Poir. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 548).

Six new iridoids - 13-O-caffeoylplumieride, 13-deoxyplumieride, plumenoside (β -dihydroplumericin acid glucosyl ester), 1 α -plumieride, 1 α -protoplumericin A and 8-isoplumieride - isolated from roots and their structures determined; plumieride, 13-O-coumaroylplumieride and protoplumericin A also isolated (*Chem. Pharm. Bull.* 1988, 36, 2784).

NEW COMPOUNDS



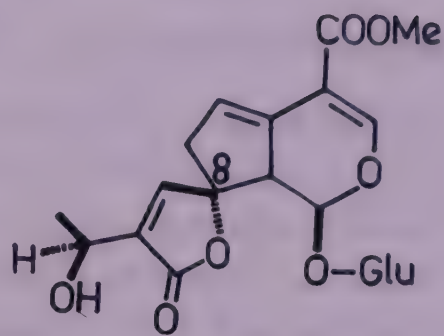
Plumenoside

1 α -Plumieride

R = H

1 α -Protoplumericin A

R = p-O-Glucosylcoumaroyl



8-Isoplumieride

P. rubra L. var. *acutifolia* Bailey; see *P. rubra* L. forma *acuminata* (Ait.) Sant. & Irani ex Shah

POA (Poaceae)

P. annua L.

P. - Chirua.

A new glycoflavone - luteolin-6C-(2''-O- α -D-mannosyl- β -D-glucoside) - isolated and characterised (*Phytochemistry* 1987, 26, 859).

Distribution : Himalayas, from Kashmir to Arunachal Pradesh, alt. 1300-3600 m and Meghalaya and Nilgiris, alt. 1500-2100 m.

PODOCARPUS (Podocarpaceae)

P. nerifolius D.Don syn. *P. polystachyus* R.Br. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 514).

Abietic acid (1.4), ginnol (0.03), dehydroabietic acid (0.01) and amentoflavone (0.01%) determined in berries (*Fiji Agric. J.* 1983, 45, 85; *Chem. Abstr.* 1985, 103, 51204 x).

P. polystachyus R.Br.; see *P. nerifolius* D.Don

PODOPHYLLUM (Podophyllaceae)

P. aurantiocaulis Hand.-Mazz. syn. *Dysosma aurantiocaulis* (Hand.-Mazz.) Hu (*auranticaulis*)

Picropodophyllin, picropodophyllone, isopicropodophyllone, podophyllotoxin, 4'-demethylpodophyllotoxin, dehydropodophyllotoxin, podophyllotoxone, 4'-demethyl-

podophyllotoxone, physcion, diphyllin, dysosmajol and dysoanthraquinone identified by HPLC (*Zhongguo Zhongyao Zazhi* 1989, 14, 420; *Chem. Abstr.* 1989, 111, 229003 m).

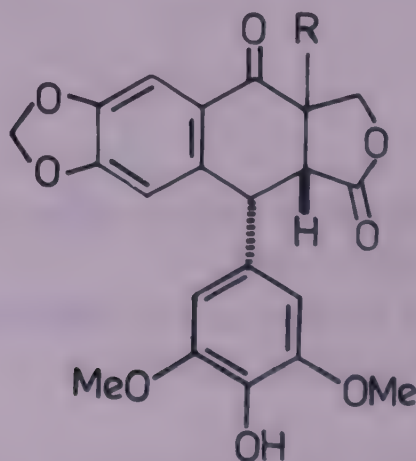
Distribution : Arunachal Pradesh.

P. emodi Wall. ex Hook.f. & Th.; see *P. hexandrum* Royle

P. hexandrum Royle syn. *P. emodi* Wall. ex Hook.f. & Th. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 514).

Two new aryltetralin lignans - 4'-demethylpodophyllotoxone and 4'-demethylisopropodophyllone - isolated along with α -peltatin, β -peltatin, deoxypodophyllotoxin, isopropodophyllone and 4'-demethyldesoxypodophyllotoxin; structures of new compounds determined (*Phytochemistry* 1984, 23, 1147); podophyllotoxin, 4'-demethylpodophyllotoxin, dehydropodophyllotoxin, picropodophyllin, podophyllotoxone and diphyllin isolated (*Phytochemistry* 1984, 23, 1147; *Zhongcaoyao* 1987, 18, 535; *Chem. Abstr.* 1988, 108, 164703 f); total synthesis of (-)podophyllotoxin (*J. Am. Chem. Soc.* 1988, 110, 7854).

NEW COMPOUNDS



4'-Demethylpodophyllotoxone

R = α -H

4'-Demethylisopropodophyllone

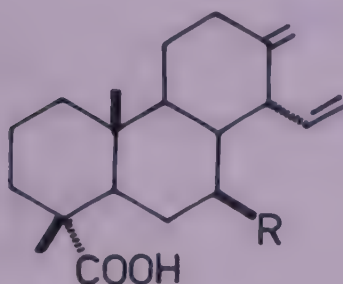
R = β -H

POGOSTEMON (Lamiaceae)

P. auricularius (L.) Hassk. syn. *Dysophylla auricularia* (L.) Blume (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 103).

Three novel diterpenoid acids - auricularic acid (cleistanth-13,15-dien-18-oic acid), its 7-hydroxy and 7-acetoxy derivatives - isolated and their structures determined (*J. Nat. Prod.* 1988, 51, 212).

NEW COMPOUNDS



Auricularic acid

R = H

7-Hydroxyauricularic acid

R = OH

7-Acetoxyauricularic acid

R = OAc

P. cablin (Blanco) Benth. syn. *P. patchouli* Hook.f. (non Pellet.) var. *suavis* Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 515).

Total synthesis of cycloseychellene (*Tetrahedron Lett.* 1984, 25, 5497); patchouli alcohol (32.77), α -bulnesene (14.85) and α -patchoulene (12.74%) determined in oil by GC-MS (*Fitoterapia* 1985, 55, 363).

P. heyneanus Benth. syn. *P. patchouli* Hook.f. (non Pellet.) (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 551).

Stereoselective total synthesis of seychellene (*Tetrahedron* 1984, 25, 5497; *J. Org. Chem.* 1985, 50, 2668).

P. parviflorus Benth.; see *P. pubescens* Benth.

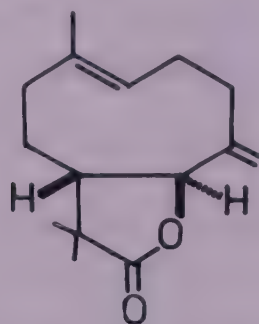
P. patchouli Pellet.; see *P. heyneanus* Benth.

P. patchouli Pellet. var. *suavis* Hook.f.; see *P. cablin* (Blanco) Benth.

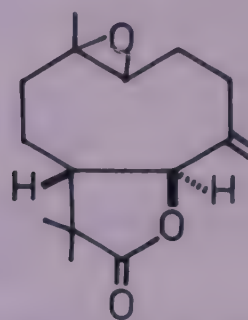
P. pubescens Benth. syn. *P. parviflorus* sensu Hook.f. (non Benth.) p.p. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 198).

Isolation and crystal structure of a new sesquiterpenoid lactone - parvinolide (*J. Chem. Res. Synop.* 1984, 394; *Chem. Abstr.* 1985, 102, 163684 q); another new lactone - epoxy-parvinolide - isolated along with friedelin, friedelin-3-ol, phytol and sitosterol; structure of new compound determined (*Phytochemistry* 1985, 24, 2735).

NEW COMPOUNDS



Parvinolide



Epoxyparvinolide

POINCIANA (Caesalpinaceae)

P. elata L.; see *Delonix elata* (L.) Gamble

P. pulcherrima L.; see *Caesalpinia pulcherrima* (L.) Swartz

P. regia Boj. ex Hook.; see *Delonix regia* (Boj. ex Hook.) Rafin.

POLYALTHIA (Annonaceae)

P. cerasoides (Roxb.) Bedd.

H. - Kudumi; Guj. - Uma; Kan. - Nettalingamara, Sannahesare; Mal. - Narelai; Mar. - Hoom, Uma; Oriya - Potmossu; Santal - Panjon; Tam. - Nakulsi, Mullili; Tel. - Gutti.

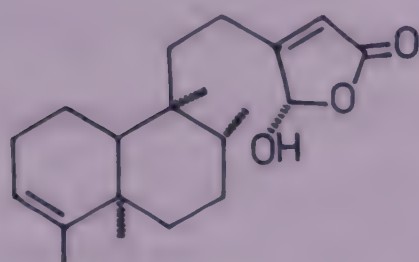
α -Spinasterol and β -sitosterol isolated from leaves and stems (*Int. J. Crude Drug Res.* 1985, 23, 73).

Distribution : Assam, Bihar, Orissa and extending to Travancore, ascending upto 900 m.

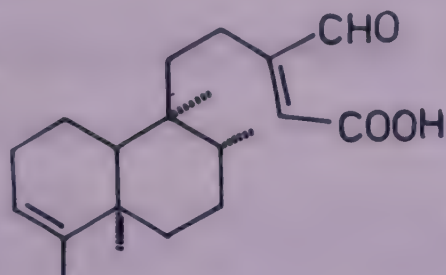
P. longifolia (Sonn.) Thw. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 517).

α -Amyrin, β -amyrin, campesterol, β -sitosterol, stigmasterol, taraxasterol, hydrocarbons (C17-C35) and esters composed of n-acids (C20-C30) and n-alkanols (C24-C58) obtained from cuticular wax of leaves; tritriacontane (29.4%) present as major constituent (*Indian Drugs* 1985, 22, 658; *Indian J. Pharmacol.* 1987, 19, 216); hyperoside, quercetin and rutin isolated from leaves (*Fitoterapia* 1986, 57, 198); two clerodane diterpenoids - 16 α -hydroxycleroda-3,13(14)Z-dien-15,16-olide (I) and 16-oxo-cleroda-3,13(14)E-dien-15-oic acid (II) - isolated and their stereostructures determined (*Phytochemistry* 1988, 27, 2899); isolation of a new azafluorene alkaloid - polylongine - and three new aporphine N-oxide alkaloids - (+)O-methylbulbocapnine- β N-oxide, (+)O-methylbulbocapnine- α N-oxide and (+)N-methylnandigerine- β N-oxide - from leaves and their characterisation (*Heterocycles* 1989, 29, 463).

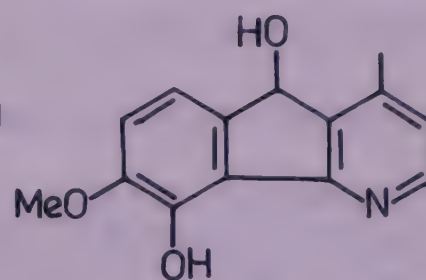
NEW COMPOUNDS



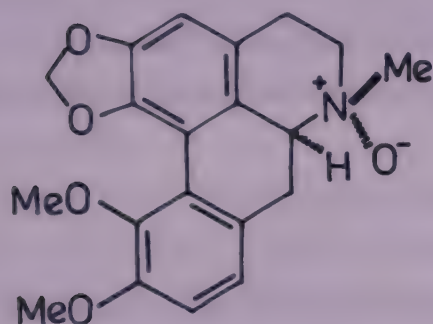
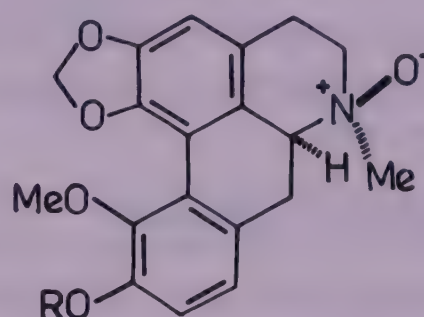
I



II



Polylongine

(+)O-Methylbulbocapnine- α N-oxide(+)O-Methylbulbocapnine- β N-oxide

R = Me

(+)N-Methylnandigerine- β N-oxide

R = H

BIOLOGICAL ACTIVITY

Taraxasterol, β -sitosterol, stigmasterol, campesterol, cholesterol, α -amyrin, β -amyrin and long-chain hydrocarbons exhibited concentration-dependent antibacterial activity against *Staphylococcus aureus*, *S. epidermidis*, *Bacillus subtilis*, *Escherichia coli*, *Klebsiella*, *Shigella dysenteriae*, *Proteus vulgaris* and *Pseudomonas aeruginosa* (*Indian J. Pharmacol.* 1987, 19, 216); clerodane diterpenoids I and II showed antifeedant properties (*Phytochemistry* 1988, 27, 2899).

P. suberosa Thw.

H. - Cham-khirni; B. - Bara chali; Assam - Makhamsra-phang, Habida cha, Bandor kola; Oriya - Karadia, Burhi chamri; Santal - Sandiome; Tel. - Chailaka duduga.

Scopoletin, β -sitosterol and its glucoside isolated from bark (*Int. J. Crude Drug Res.* 1985, 23, 73); β -amyrin (65.76), β -sitosterol (64.00), lupeol (31.68), stigmasterol (20.88), campesterol (14.32) and α -amyrin (2.55%) determined in leaves (*Acta Cienc. Indica; Chem.* 1986, 12, 152; *Chem. Abstr.* 1987, 107, 151195 w).

Distribution : Almost throughout India, in plains from Assam to Uttar Pradesh in the north and Kerala in the south.

POLYCARPON (Caryophyllaceae)

P. indicum (Retz.) Merrill; see *P. prostratum* (Forsk.) Asch. & Schweinf.

P. loeflingiae (Wt. & Arn.) Benth. & Hook.f.; see *P. prostratum* (Forsk.) Asch. & Schweinf.

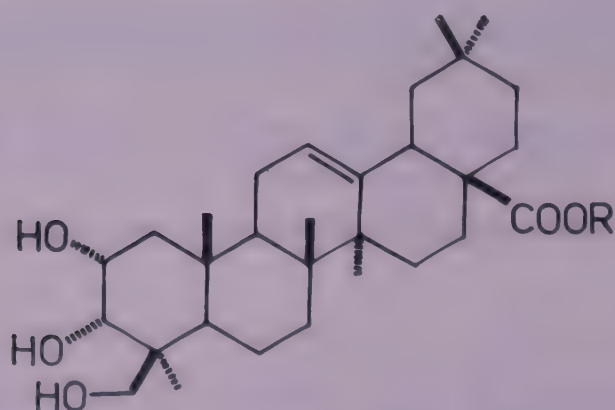
P. prostratum (Forsk.) Asch. & Schweinf. syn. *P. indicum* (Retz.) Merrill, *P. loeflingiae* (Wt. & Arn.) Benth. & Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 199).

A new saponin - carponoside A - isolated and partially characterised; on acid hydrolysis it yielded saikogenin D, glucose and arabinose; hentriacontane, hentriacontanol, β -amyrene, β -sitosterol, stigmasterol, saikogenin A and saikogenin D also isolated (*J. Indian Chem. Soc.* 1987, 64, 258).

POLYGALA (Polygalaceae)

P. japonica Houtt. syn. *P. sibirica* sensu Benn., p.p. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 518).

A new triterpene glycoside - saponin B - isolated from aerial parts and characterised as 28-O[β -D-glucopyranosyl(1 \rightarrow 2)- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-glucopyranosyl]-2 α ,3 α ,24-tri-hydroxyolean-12-en-28-oic acid (*Zhiwu Xuebao* 1986, 28, 196; *Chem. Abstr.* 1986, 105, 57905 q).

NEW COMPOUNDS

Saponin B

R = Glu(2 \rightarrow 1)Glu(2 \rightarrow 1)Glu

P. sibirica Benn.; see *P. japonica* Houtt.

POLYGONATUM (Liliaceae)

P. verticillatum (L.) Allioni (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 518).

Diosgenin (1.5%) isolated from rhizomes (*Gazi Univ. Eczacilik Fak. Derg.* 1987, 4, 11; *Chem. Abstr.* 1987, 107, 205008 h).

POLYGONUM (Polygonaceae)

P. alatum Bucl.-Ham. ex Spreng.; see *P. nepalense* Meissn.

P. amplexicaule D. Don

H. - Kukar makri, Durpa tandar.

Isoorientin-O-arabinoside, isorhamnetin, isovitexin and its O-arabinoside isolated from leaves (*Indian J. Pharm. Sci.* 1987, 49, 154); isolation of β -amyrin, chrysophanol, emodin, physcion and stigmasterol from rhizomes (*Indian Drugs* 1988, 26, 37).

Distribution : Himalayas from Kashmir to Sikkim, alt. 1800-4800 m.

P. aviculare L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 519).

Kaempferol-3-arabinoside, luteolin, quercetin-3-galactoside, rhamnetin-3-galactoside, vitexin and isovitexin isolated (*Khim.-Farm. Zh.* 1986, 20, 190; *Chem. Abstr.* 1986, 104, 199798 k).

BIOLOGICAL ACTIVITY

Vitexin and rhamnetin-3-galactoside inhibited aggregation of human blood platelets whereas luteolin and kaempferol-3-arabinoside retarded or stimulated aggregation depending upon experimental conditions (*Khim.-Farm. Zh.* 1986, 20, 190; *Chem. Abstr.* 1986, 104, 199798 k).

P. bistorta Garcke; see *P. viviparum* L.

P. capitatum Buch.-Ham. ex D. Don

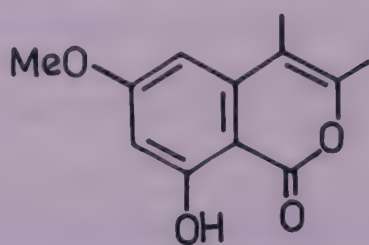
24-Hydroxytetracosanone, 29-hydroxynonacosan-3-one, gallic acid and β -sitosterol isolated (*Zhongcaoyao* 1985, 16, 149; *Chem. Abstr.* 1985, 103, 76116 h).

Distribution : Himalayas, from Himachal Pradesh to Bhutan, alt. 1200-1800 m and Meghalaya, alt. 900-1600 m.

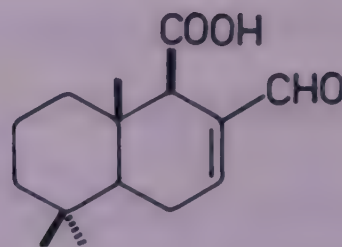
P. hydropiper L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 519).

Quercetin, kaempferol, isorhamnetin and rhamnazin isolated (*Khim. Prir. Soedin.* 1984, 658; *Chem. Abstr.* 1985, 102, 42886 y); synthesis of (-)-warburganal (*Chem. Lett.* 1985, 1113; *Chem. Abstr.* 1986, 105, 79178 g); isolation and structure determination of polygonic acid from leaves; 11-ethoxycinnamolide, fuegin, isopolygonal, polygodial acetal, polygonone and valdiviolide also isolated (*Phytochemistry* 1985, 24, 1521); polygodial synthesised (*Chem. Ind.* 1985, 735; *Tetrahedron* 1986, 42, 273; *Youji Huaxue* 1987, 354; *Chem. Abstr.* 1988, 109, 149817 y); a new isocoumarin - polygonolide - isolated from roots and structure elucidated as 3,4-dimethyl-6-methoxy-8-hydroxyisocoumarin and confirmed by synthesis (*Phytochemistry* 1986, 25, 517); synthesis of drimenin (*Youji Huaxue* 1987, 354; *Chem. Abstr.* 1988, 109, 149817 y).

NEW COMPOUNDS



Polygonolide



Polygonic acid

BIOLOGICAL ACTIVITY

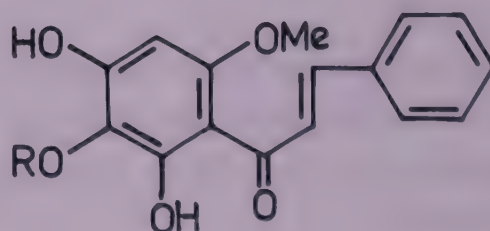
Polygonic acid exhibited anticomplement activity (*Phytochemistry* 1985, 24, 1521); polygonolide showed anti-inflammatory activity and also inhibited reversed passive Arthus reaction (*Phytochemistry* 1986, 25, 517).

P. lopathifolium L. var. *lopathifolium*

Quercetin-3-O- β -D-glucopyranoside, -galactopyranoside, -glucoside-2''-gallate and -arabinofuranoside, kaempferol-3-O- β -D-galactopyranoside and -glucoside-2''-gallate isolated from aerial parts (*Khim. Prir. Soedin.* 1986, 511; *Chem. Abstr.* 1987, 106, 81533 h); three new chalcone derivatives (I, II and III) isolated and their structures determined; 2'-hydroxy-4',6'-dimethoxychalcone also isolated (*Phytochemistry* 1988, 27, 2359).

Distribution : Kashmir eastwards to north-east India, Orissa and Western Ghats, ascending to 2100 m in the hills.

NEW COMPOUNDS



I

R = Angeloyl

II

R = 2-Me Butyryl

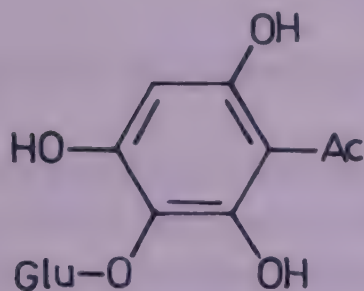
III

R = Isovaleryl

P. multiflorum Thunb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 520).

Emodin and its monomethyl ether isolated (*Zhongyao Tongbao* 1986, 11, 727; *Chem. Abstr.* 1987, 106, 143848 a); a new acetophenone glucoside - polygoacetophenoside - isolated along with quercetin-3-O-galactoside and -3-O-arabinoside; structure of new compound determined (*Planta Med.* 1987, 53, 273).

NEW COMPOUNDS

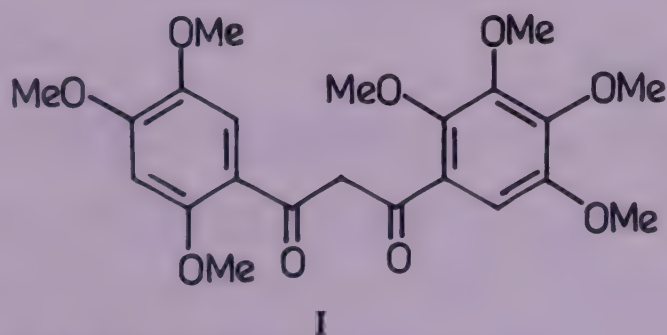


Polygoacetophhenoside

P. nepalense Meissn. syn. *P. punctatum* Buch.-Ham. ex D.Don, *P. alatum* Buch.-Ham. ex Spreng. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 200).

Two new flavonoids isolated and characterised as 5,4'-dimethoxy-6,7-methylenedioxyflavanone and 5,6,7,2',3',4',5'-heptamethoxyflavanone; 5,6,7,4'-tetramethoxyflavanone, sitosterol and taraxerone also isolated (*Phytochemistry* 1986, 25, 2223); a new heptamethoxy-1,3-diketo compound (I) isolated and its structure determined; hyperoside, luteolin-6-C-glucoside, quercetin-3-O-rhamnobioside and β -sitosterol glycoside also isolated (*J. Nat. Prod.* 1987, 50, 357).

NEW COMPOUNDS



I

P. punctatum Buch.-Ham. ex D.Don; see *P. nepalense* Meissn.

P. suffultum Maxim.

Proanthocyanidins (13.15%) present in stems and roots (*Zhongcaoyao* 1989, 20, 256; *Chem. Abstr.* 1989, 111, 150584 t).

Distribution : Himalayas, Sikkim and Bhutan, alt. 2700-3200 m.

P. viviparum L. syn. *P. bistorta* Garcke (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 200).

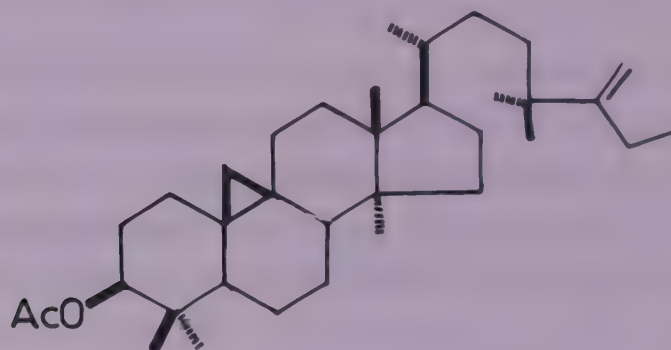
Isolation of proanthocyanidins (10.18%) (*Zhongcaoyao* 1989, 20, 256; *Chem. Abstr.* 1989, 111, 150584 t).

POLYPODIUM (Polypodiaceae)

P. vulgare L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 522).

Plant extract showed antiviral activity against vesicular stomatitis virus in monkey cell culture (*Ann. Pharm. Fr.* 1986, 44, 41; *Chem. Abstr.* 1986, 105, 108018 n).

A new cycloartane triterpenoid - cyclopodmenyl acetate - isolated from rhizomes and characterised as 24,24,27-trimethyl-9,19-cyclolanost-25-en-3 β -yl acetate (*Chem. Pharm. Bull.* 1989, 37, 560).

NEW COMPOUNDS

Cyclopodmenyl acetate

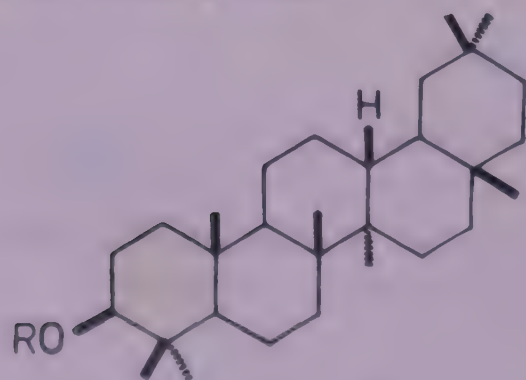
POLYSCIAS (Araliaceae)

P. pinnata J.R. & G.Forst.; see *P. scutellaria* (Burm.f.) Fosberg

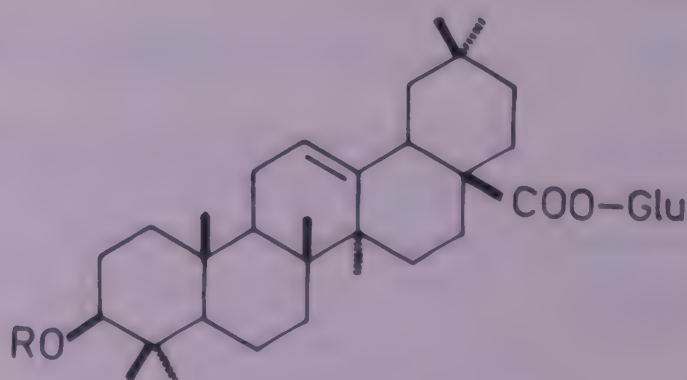
P. scutellaria (Burm.f.) Fosberg syn. *P. pinnata* sensu Hook.f. (non J.R. & G.Forst.)

Isolation and structure determination of polysciasaponin P7 from leaves (*Pharmazie* 1988, 43, 296; *Chem. Abstr.* 1988, 109, 89775 w); a new triterpene glycoside - saponin C - along with saponins A (calenduloside E) and B isolated from leaves and its structure elucidated (*Phytochemistry* 1989, 28, 1539).

Distribution : Grown in gardens for its ornamental foliage.

NEW COMPOUNDS

Polysciasaponin P7
R = Gluc.acid

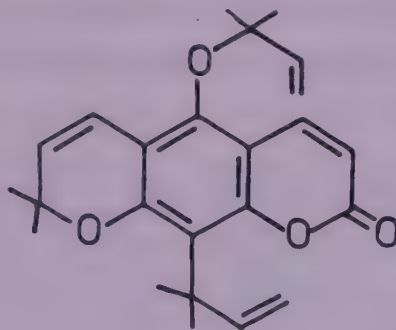


Saponin C
R = Gluc.acid(3 \rightarrow 1)Glu

PONCIRUS (Rutaceae)

P. trifoliata (L.) Rafin. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 556).

Determination of campesterol (40.9), sitosterol (39.5), stigmasterol (16.7) and cholesterol (2.9%) in roots (*Phytochemistry* 1985, 24, 2469); a new coumarin - ponfolin - isolated from roots and its structure elucidated; nordentatin, clausarin, seselin and xanthyletin also isolated (*Chem. Pharm. Bull.* 1986, 34, 3922); isolation of 5-hydroxy-noracronycine from root bark along with poncitrin, nordentatin and marmesin (*J. Nat. Prod.* 1986, 49, 1154).

NEW COMPOUNDS

Ponfolin

PONGAMIA (Papilionaceae)

P. glabra Vent.; see *Derris indica* (Lamk.) Bennet

P. pinnata (L.) Pierre; see *Derris indica* (Lamk.) Bennet

POPULUS (Salicaceae)

P. italica Moench.; see *P. nigra* L. var. *italica* (Moench.) Koehne

P. nigra L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 522).

2-Methylpropyl-, 2-methyl-2-propenyl-, 2-methylbutyl-, 3-methylbutyl-, 2-methyl-2-butenyl-, 4-methylpentyl-, 5-methylhexyl- and 3,7-dimethyl-2,6-octadienyl caffeates identified in bud exudate by GC-MS (*Z. Naturforsch.* 1988, 43C, 795; *Chem. Abstr.* 1989, 110, 132216 z); 3,3-dimethylallyl caffeate, 3,3-dimethyl allyl ferulate, isopent-3-enyl caffeate and isopent-3-enyl ferulate isolated from buds and propolis (*Phytochemistry* 1989, 28, 871).

P. nigra L. var. *italica* (Moench.) Koehne syn. *P. nigra* L. var. *pyramidalis* Spach, *P. italica* Moench. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 557).

3,3-Dimethylallyl caffeate, 3,3-dimethylallyl ferulate, isopent-3-enyl caffeate and isopent-3-enyl ferulate from buds and propolis (*Phytochemistry* 1989, 28, 871).

P. nigra L. var. *pyramidalis* Spach; see *P. nigra* L. var. *italica* (Moench.) Koehne

PORTULACA (Portulacaceae)

P. grandiflora Hook.; see *P. pilosa* L. var. *grandiflora* (Hook.) Geesink

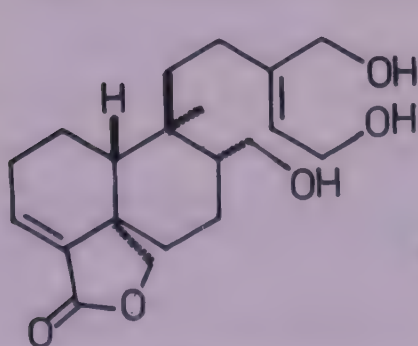
P. oleracea L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 558).

Pharmacognostic studies of leaves and stems indicated presence of carbohydrates, lipids, glycosides, alkaloids, sterols, triterpenes and flavonoids (*Bull. Pharm. Sci. Assiut Unit.* 1985, 8, 41; *Chem. Abstr.* 1986, 104, 155784 y).

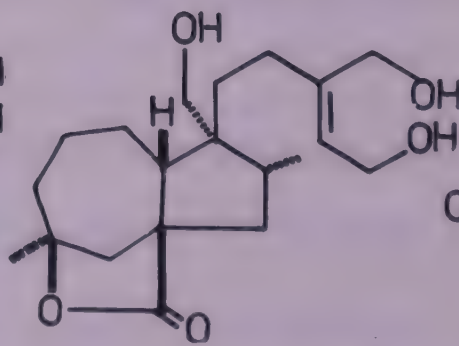
P. pilosa L. var. *grandiflora* (Hook.) Geesink syn. *P. grandiflora* Hook. (*Compend. Indian Med. Plants*, Vol.3, Rastogi & Mehrotra, PID, New Delhi, 1993, p.522).

A new clerodane diterpene - portulide - isolated and its structure determined (*Chem. Lett.* 1984, 1521; *Chem. Abstr.* 1985, 102, 3231 m); isolation and structure elucidation of four new diterpenoids - portulic lactone, 3-hydroxyportulol ether, 5-hydroxyportulal and 5-hydroxyportulic acid along with portulal, portulol and portulic acid (*Chem. Pharm. Bull.* 1985, 33, 2171); another three new diterpenes - portulenone, portulenol and portulene - isolated and their structures established (*Chem. Lett.* 1985, 1585; *Chem. Abstr.* 1986, 105, 222721 m).

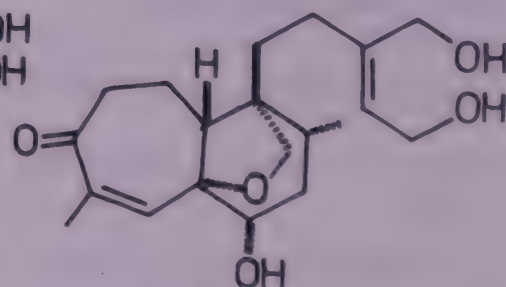
NEW COMPOUNDS



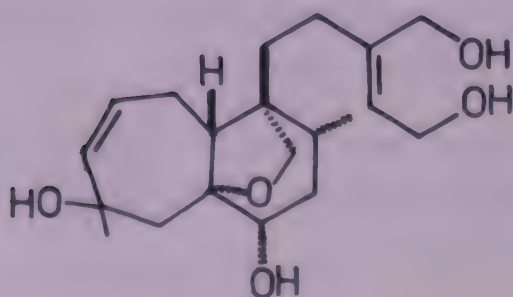
Portulide



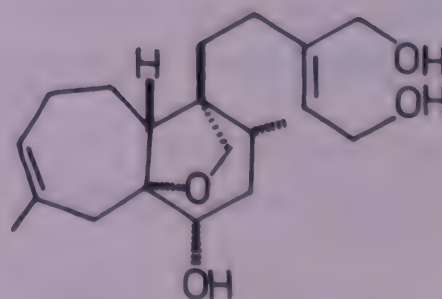
Portulic lactone



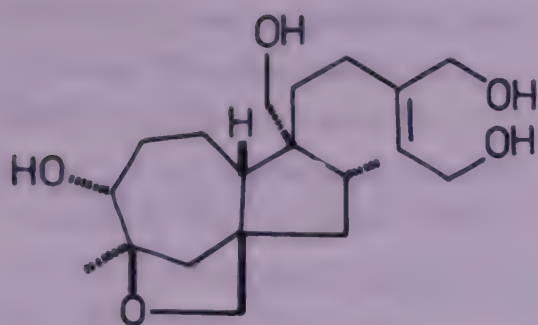
Portulenone



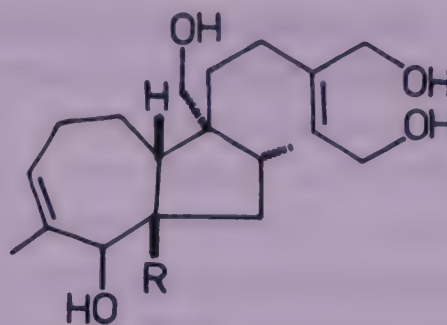
Portulenol



Portulene



3-Hydroxyportulol ether



5-Hydroxyportulal

R = CHO

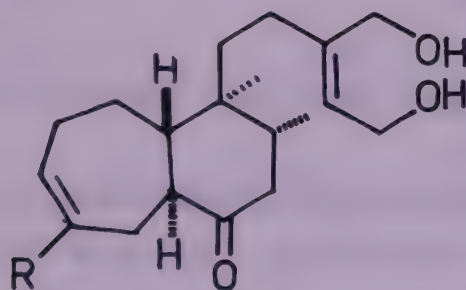
5-Hydroxyportulic acid

R = COOH

P. pilosa L. ssp. *pilosa* syn. *P. tuberosa* Roxb., *P. suffruticosa* Wall. ex Wt. & Arn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 202).

Two new diterpenoids - pilosanones A and B - isolated and their structures determined (*Chem. Commun.* 1987, 151); isolation of n-hentriacontane, n-triacontane, n-hexacosanol, lupeol, β -sitosterol, its glucoside, stigmasterol and quercetin-3-rhamnoside from aerial parts (*Herba Pol.* 1987, 33, 71; *Chem. Abstr.* 1988, 109, 187327 w).

NEW COMPOUNDS



Pilosanone A

R = Me

Pilosanone B

R = CH₂OH

P. suffruticosa Wall. ex Wt. & Arn.; see *P. pilosa* L. ssp. *pilosa*

P. tuberosa Roxb.; see *P. pilosa* L. ssp. *pilosa*

PREMNA (Verbenaceae)

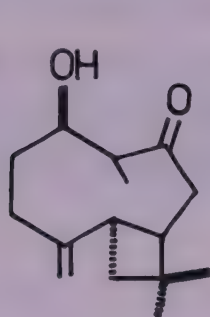
P. corymbosa Rottl. & Willd.; see *P. integrifolia* L.

P. herbacea Roxb.; see *Pygmaepremna herbacea* (Roxb.) Moldenke

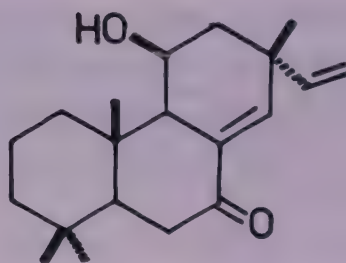
P. integrifolia L. syn. *P. corymbosa* sensu Hook.f. (non Rottl. & Willd.), *P. obtusifolia* R.Br. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 560).

Isolation of aphelandrine and luteolin from stem bark and leaves respectively (*Planta Med.* 1984, 50, 281); a new sesquiterpene - 5-hydroxy-4,5-dihydrocaryophyllen-3-one (I) - and two new diterpenes - 11 β -hydroxy-7-ketosandaracopimar-8(14),15-diene (II) and premnenol - isolated from root bark; premnaspirodiene, sandaracopimar-8(14),15-diene, its 7 α -hydroxy derivative and caryophyllen-3-one also isolated (*Indian J. Chem.* 1985, 24B, 403); roots afforded 6-C- β -D-glucopyranosyl-8-C- β -D-xylopyranosyl apigenin (*Indian Drugs* 1986, 23, 482); isolation of two new phenolic diterpenoids - 11,12,16-trihydroxy-abieta-5,8,11,13-tetraen-7-one and 11,14-dihydroxy-12,16-epoxy-abieta-5,8,11,13-tetraen-7-one from root bark (*Indian J. Chem.* 1987, 26B, 191).

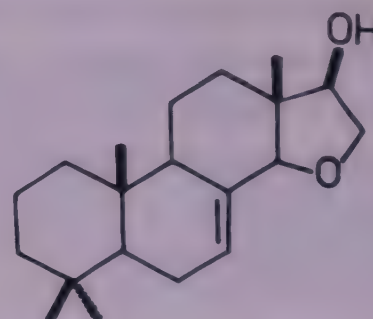
NEW COMPOUNDS



I



II

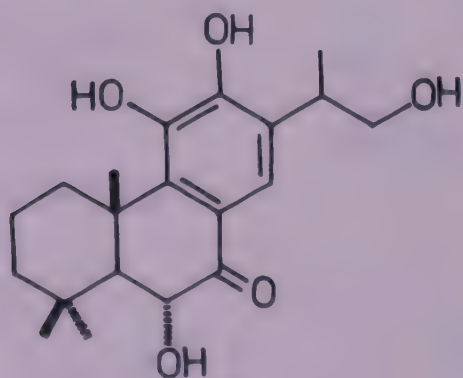


Premnenol

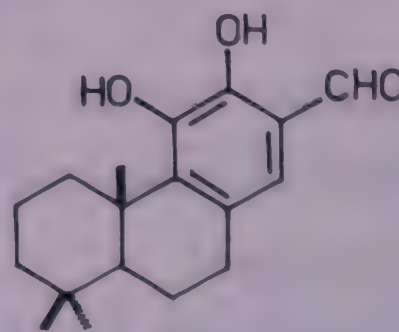
P. latifolia Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 524).

Absolute configuration of nellionol and 5-dehydronellionol determined by synthesis (*Bull. Chem. Soc. Jpn.* 1985, 58, 1165); structures of premnolal and nellional revised (*Indian J. Chem.* 1985, 24B, 893).

NEW COMPOUNDS



Nellional



Premnolal

P. latifolia var. *mollissima* (Roth) Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 526).

A new hydroxypimarane isolated from root bark and characterised as 1β -hydroxy-isopimar-7,15-diene (*Indian J. Chem.* 1985, 24B, 403); synthesis of taxodione (*J. Org. Chem.* 1989, 54, 5712).

P. obtusifolia R.Br.; see *P. integrifolia* L.

P. tomentosa Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 203).

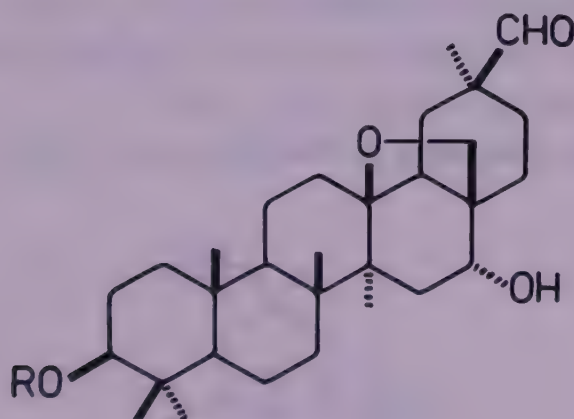
Vicenin-3 isolated from heartwood (*Curr. Sci.* 1984, 53, 573).

PRIMULA (Primulaceae)

P. denticulata Smith (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 526).

2,2'-Dihydroxychalcone isolated from leaf exudate (*Biochem. Physiol. Pflanz.* 1986, 181, 667; *Chem. Abstr.* 1986, 105, 222754 z); a new triterpenoid saponin - primulanin - isolated from whole plant and its structure determined (*Phytochemistry* 1988, 27, 304).

NEW COMPOUNDS



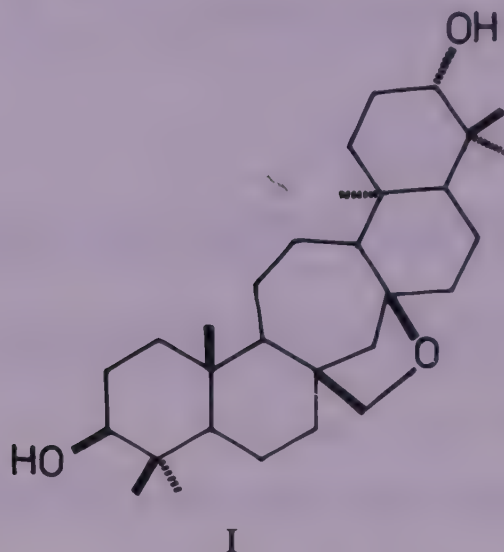
Primulanin

R = Ara(4→1)Glu(2→1)Xyl

P. rosea Royle (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 527).

A new sapogenin isolated and characterised as $14\beta,26$ -epoxyserratane- $3\beta,21\alpha$ -diol (I) (*Planta Med.* 1985, 51, 334).

NEW COMPOUNDS

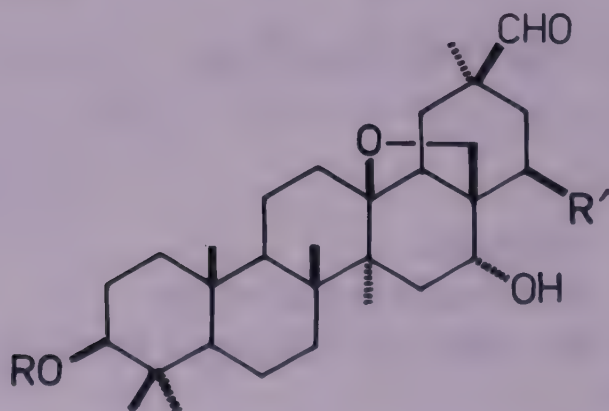


P. umbellata (Lour.) Bentvelzen syn. *Androsace saxifragifolia* Bunge (*saxifragaefolia*)

A triterpenoid - androsacenol - obtained from acid hydrolysate of saponin mixture from aerial parts and its structure determined; cyclamiretins A and D also isolated (*Phytochemistry* 1984, 23, 1475); isolation and structure elucidation of two new triterpenoid tetrasaccharides - saxifragifolins A and B - from aerial parts (*J. Chem. Soc. Perkin 1* 1986, 1527); two new triterpenoid pentasaccharides - saxifragifolins C and D - isolated from aerial parts and their structures established (*J. Chem. Soc. Perkin 1* 1987, 1963).

Distribution : Gangetic plains, ascending to Himalayas upto 1200 m.

NEW COMPOUNDS



Androsacenol

R = H, R' = OAc

Saxifragifolin A

R = Ara[(2→1)Glu](4→1)Glu(2→1)Xyl, R' = OAc

Saxifragifolin B

R = Ara[(2→1)Glu](4→1)Glu(2→1)Xyl, R' = H

Saxifragifolin C

R = Ara[(2→1)Glu(4→1)Glu](4→1)Glu(2→1)Xyl, R' = OAc

Saxifragifolin D

R = Ara[(2→1)Glu(4→1)Glu](4→1)Glu(2→1)Xyl, R' = H

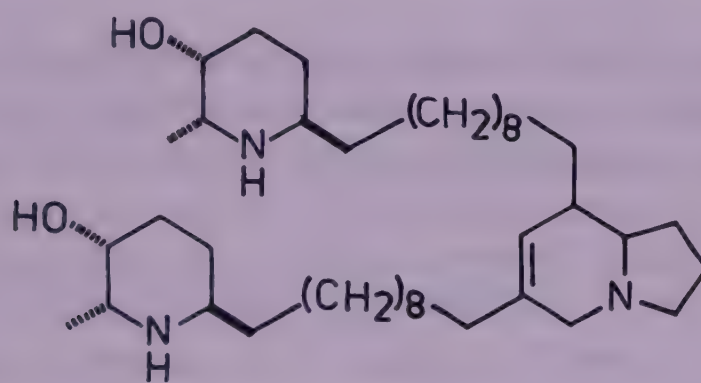
PRISTIMERA (Hippocrateaceae)

P. indica (Willd.) A.C. Smith; see *Reissantia indica* (Willd.) Halle

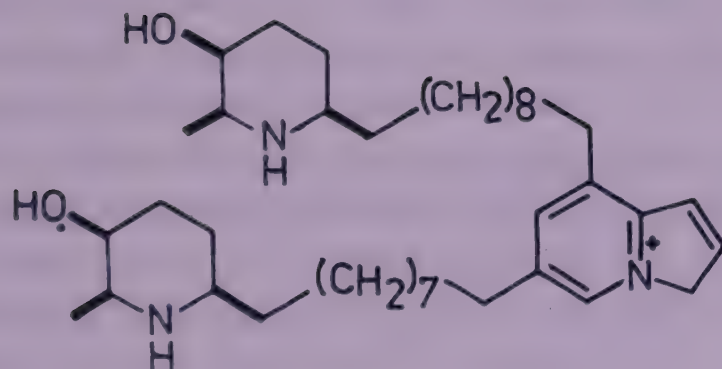
PROSOPIS (Mimosaceae)

P. chilensis (Molana) Stuntze syn. *P. juliflora* (Swartz) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 528).

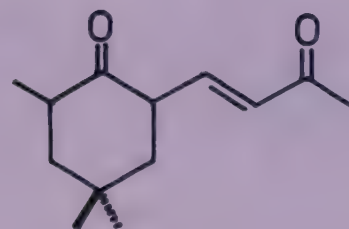
A new monocyclic diketone - prosopidione - isolated from leaves and its structure determined (*Phytochemistry* 1989, 28, 278); isolation of two new alkaloids - juliprosinene and juliflorinine - from leaves and their structure elucidation (*J. Nat. Prod.* 1989, 52, 497).

NEW COMPOUNDS

Juliflorinine



Juliprosinene



Prosopidione

P. cineraria (L.) Druce syn. *P. spicigera* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 530).

Spicigerine synthesised (*J. Chem. Res., Synop.* 1985, 278; *Chem. Abstr.* 1986, 104, 1300096 n); triacontanol (plant growth regulator) and β -sitosterol isolated from galls (*Trans. Indian Soc. Desert Technol.* 1987, 12, 149; *Chem. Abstr.* 1988, 109, 167348 a).

P. glandulosa Tarr. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 530).

Isolation of prosopol, prosopenol, oleanolic acid and β -sitosterol from flowers (*Fitoterapia* 1986, 57, 457).

P. juliflora (Swartz) DC.; see *P. chilensis* (Molana) Stuntze

P. spicigera L.; see *P. cineraria* (L.) Druce

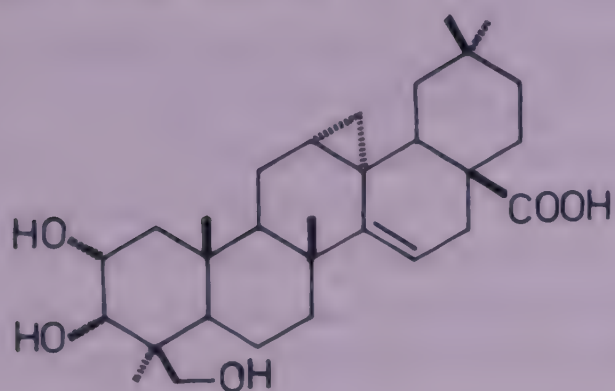
PRUNELLA (BRUNELLA) (Lamiaceae)

P. hispida Benth.; see *P. vulgaris* L.

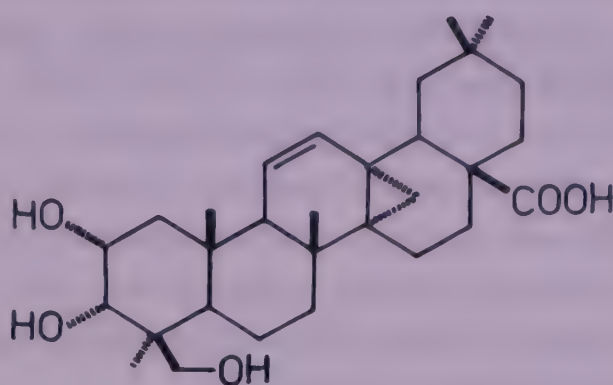
P. vulgaris L. syn. *Brunella vulgaris* L., *Prunella vulgaris* L. var. *hispida* (Benth.) Hook.f., *P. hispida* Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 531).

3,5-Diglucosides of hirsutidin, malvidin and peonidin isolated from flowers along with quercetin and kaempferol (*Acta Cienc. Indica*, *Chem.* 1984, 10, 37; *Chem. Abstr.* 1985, 103, 138524 a); aerial parts contained flavonoids (0.16), coumarins (0.33), tannins and triterpenoid saponins; isoquercetin, hyperin and rutin isolated (*Rastit. Resur.* 1985, 21, 463; *Chem. Abstr.* 1986, 104, 65934 t); isolation of β -amyrin, daucosterol, oleanolic acid and ursolic acid (*Beijing Yike Daxue Xuebao* 1985, 17, 297; *Chem. Abstr.* 1986, 105, 206310 w); aerial parts afforded esculetin, scopoletin and umbelliferone (*Khim. Pri. Soedin.* 1986, 510; *Chem. Abstr.* 1987, 106, 2902 b); isolation and characterisation of a new triterpene as $2\alpha,3\alpha,24$ -trihydroxyolean-12-en-28-oic acid from leaves and stem; spinasterol, stigmast-7-enol, ursolic acid, oleanolic acid, $2\alpha,3\alpha$ -dihydroxyursan-12-en-28-oic acid, 3-epimaslinic acid, 2α -hydroxyursolic acid, maslinic acid and $2\alpha,3\alpha,23$ -trihydroxyolean-12-en-28-oic acid also isolated (*Phytochemistry* 1986, 25, 729); cinaroside, luteolin and homoorientin isolated from aerial parts (*Khim. Pri. Soedin.* 1987, 449; *Chem. Abstr.* 1987, 107, 151266 v); a new triterpene isolated and characterised as $1\alpha,2\alpha$ -dihydroxyursolic acid; β -sitosterol, betulic and ursolic acids also obtained (*Yunnan Zhiwu Yanjiu* 1987, 9, 503; *Chem. Abstr.* 1988, 108, 164741 s); 1,8-cineole (44.82), β -pinene (15.73), linalool (6.4), myrcene (5.95), α -phellandrene (5.57) and linalyl acetate (4.18%) determined in essential oil by capillary GC/FT-IR (*Yaowu Fenxi Zazhi* 1988, 8, 264; *Chem. Abstr.* 1989, 110, 36753 b); isolation of two hexacyclic triterpenoids as methyl esters from roots and their characterisation as (12R,13S) $2\alpha,3\alpha,24$ -trihydroxy-12,13-cyclotaraxer-14-en-28-oic acid (I) and (13S,14R) $2\alpha,3\alpha,24$ -trihydroxy-13,14-cycloolean-11-en-28-oic acid (II) (*Phytochemistry* 1988, 27, 2921).

NEW COMPOUNDS



I



II

BIOLOGICAL ACTIVITY

Ursolic acid exhibited significant cytotoxicity towards lymphocytic leukaemia cells P-388 and L-1210 as well as human lung carcinoma cells A-549. It also showed marginal cytotoxicity in KB and human colon (HCT-8) and mammary (MCF-7) tumor cells (*Planta Med.* 1988, 54, 308).

P. vulgaris L. var. *hispida* (Benth.) Hook.f.; see *P. vulgaris* L.

PRUNUS (Rosaceae)

P. amygdalus Batsch; see *P. dulcis* (Mill.) D.A.Webb.

P. armeniaca L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 562).

Avenasterol-5-ene, β -sitosterol and stigmasterol isolated from pits (*Pharmazie* 1985, 40, 505; *Chem. Abstr.* 1985, 103, 193166 k); kernels contained total fat (40.9), total protein (23.1) and mineral constituents (2.8%); oleic acid (51.6) and linoleic acid (36.6%) also present (*Khranit. Prom.-St.* 1988, 37, 26; *Chem. Abstr.* 1988, 109, 89783 x).

P. avium L. syn. *Cerasus avium* Moench (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 531).

Isolation of prunetin-5-glucoside from peduncle (*Phytochemistry* 1989, 28, 1560).

P. bokhariensis Royle ex Koehne

H. - Alubukhara.

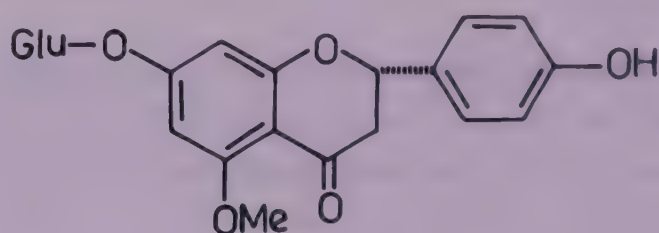
Seed oil exhibited antiseptic activity against human pathogenic bacteria and phytopathogenic fungi (*Fitoterapia* 1988, 59, 126).

Distribution : Kashmir and Himachal Pradesh.

P. cerasoides D.Don syn. *P. puddum* (Roxb. ex Ser.) Roxb. ex Brand. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 531).

Chrysophanol, emodin and their 8 β -D-glucosides, orientalone, physcion and β -sitosterol glucoside isolated from stem bark (*Proc. Natl. Acad. Sci. India* 1985, 55, 95; *Chem. Abstr.* 1986, 105, 57919 x); a new flavanone glycoside - puddumin A - isolated from stem sapwood and characterised; genistein and prunetin also isolated (*J. Nat. Prod.* 1987, 50, 232); n-pentacosane, triacontane, n-octacosanol, β -sitosterol and ursolic acid identified in unsaponifiable part of petrol extract of sapwood whereas oleic, palmitic and stearic acids identified in saponifiable part; afzelin, kaempferitrin, naringenin and β -sitosterol- β -D-glucoside isolated from ethanol extract (*Fitoterapia* 1987, 58, 140).

NEW COMPOUNDS



Puddumin A

P. cerasus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 531).

Avenasterol-5-ene, avenasterol-7-ene, sitosterol, stigmasterol and stigmast-7-enol isolated from pits (*Pharmazie* 1985, 40, 505; *Chem. Abstr.* 1985, 103, 193166 k); prunetin-5-glucoside isolated from peduncle (*Phytochemistry* 1989, 28, 1560).

P. communis Huds.; see *P. domestica* L.

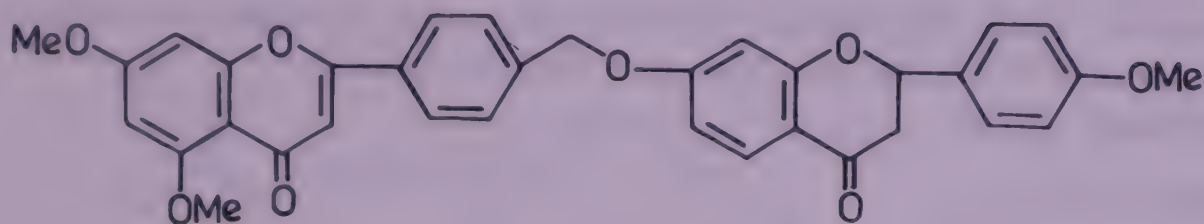
P. domestica L. syn. *P. communis* Huds. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 532).

Avenasterol-5-ene, β -sitosterol and stigmasterol isolated from pits (*Pharmazie* 1985, 40, 505; *Chem. Abstr.* 1985, 103, 193166 k).

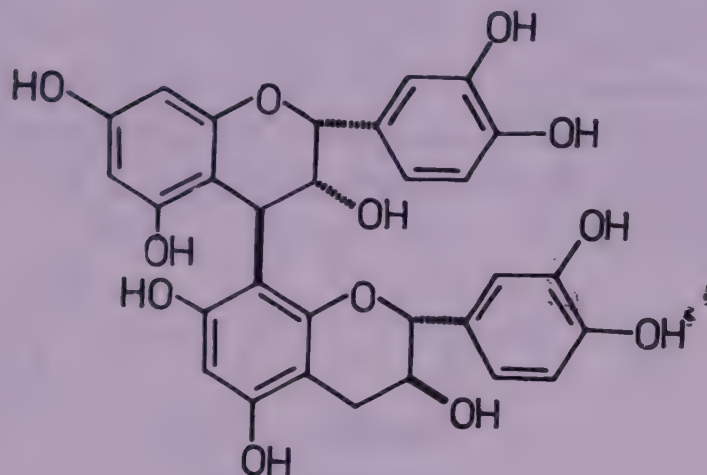
P. dulcis (Mill.) D.A.Webb. syn. *P. amygdalus* Batsch, *Amygdalus communis* L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 564).

A new biflavone - 4'''-methoxy-2'',3''-dihydroflavonyl-4',4''-oxymethyl-5,7-dimethoxyflavone (I) - isolated from seed coat along with coumaric acid, 2-methylnonacosan-3-one, n-octacosanol, n-triacontane and β -sitosterol (*Herba Pol.* 1987, 33, 163; *Chem. Abstr.* 1988, 109, 226707 s); procyanidin dimer (II) isolated from seed coat and characterised by ¹³C-NMR; (+) catechin and (-)epicatechin also isolated (*Z. Lebensm.-Unters. Forsch.* 1988, 187, 347; *Chem. Abstr.* 1989, 110, 72502 c).

NEW COMPOUNDS



I



II

P. mahaleb L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 330).

Seeds extract showed sedative and vasodilatory effects.

Coumarin, dihydrocoumarin, herniarin and its glucoside isolated from seeds (*J. Nat. Prod.* 1986, 49, 721).

P. persica (L.) Batsch (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 532).

Avenasterol-5-ene, β -sitosterol and stigmasterol isolated from pits (*Pharmazie* 1985, 40, 505; *Chem. Abstr.* 1985, 103, 193166 k); kaempferol, dihydrokaempferol, hentriacontane, hentriacontanol, naringenin, quercetin, β -sitosterol and its glucoside isolated from heartwood (*Indian J. Pharm. Sci.* 1988, 50, 321).

P. puddum (Roxb. ex Ser.) Roxb. ex Brand.; see *P. cerasoides* D. Don

PSEUDOCYCLOSORUS (Thelypteridaceae)

P. esquirolii (C. Chr.) Ching

Isolation of a new flavanone glycoside - 2(S)eriodictyol-7-O-methyl-3'-O- β -D-glucopyranoside - along with maltol-3-O- β -D-glucopyranoside, astragalin and shikimic acid (*Yakugaku Zasshi* 1986, 106, 989; *Chem. Abstr.* 1987, 106, 116492 y).

Distribution : Sikkim.

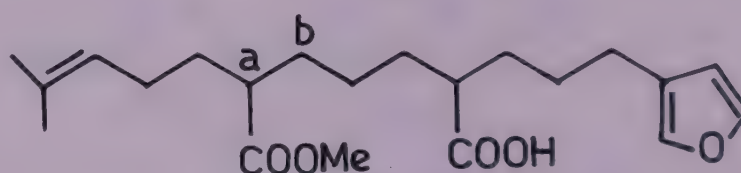
PSIDIA (Asteraceae)

P. zeylanica (Arn.) Grierson syn. *Microglossa zeylanica* (Arn.) Benth.

Two new alicyclic diterpenes - microglossic acid and dihydromicroglossic acid - isolated from aerial parts of plant grown in Sri Lanka and their structures elucidated; caryophyllen-1,10-epoxide, dammadienyl acetate, dehydrofalcarindiol, 5,4'-dihydroxy-6,7,8,3'-tetramethoxyflavone, β -farnesene and squalene also isolated (*Phytochemistry* 1987, 26, 2408).

Distribution : Kerala and Tamil Nadu, ascending to 1800 m.

NEW COMPOUNDS



Microglossic acid

ab = Δ

Dihydromicroglossic acid

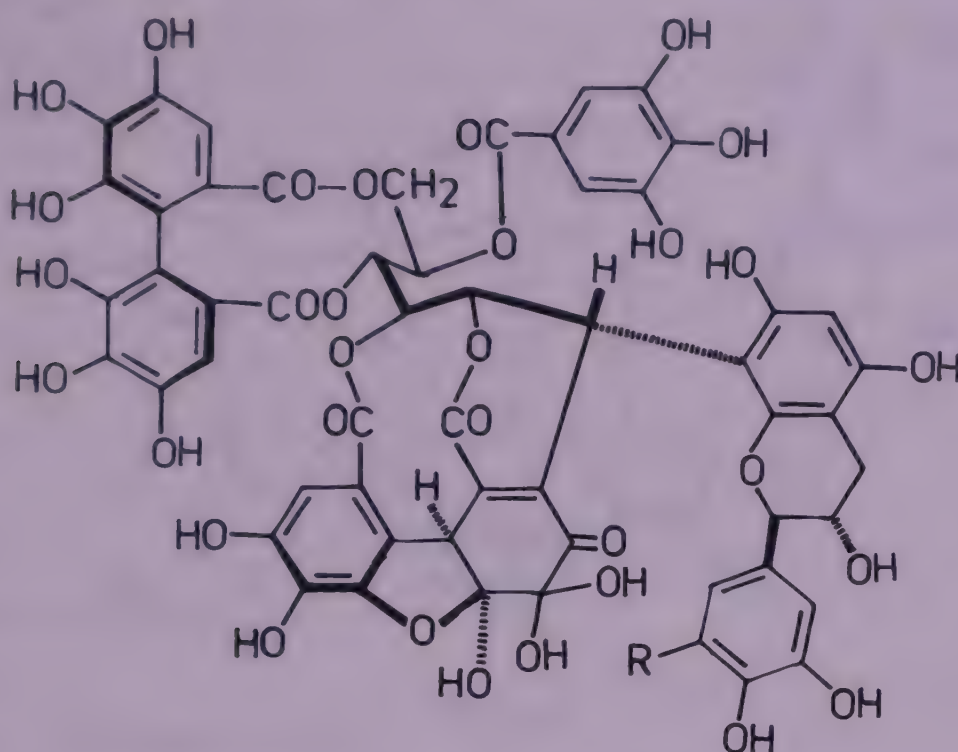
PSIDIUM (Myrtaceae)

P. guajava L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 533).

Oral administration of leaf extract inhibited hyperglycaemia in alloxan-induced diabetic rats. It also inhibited adrenaline-induced lipolysis in fat cells from rat epididymal adipose tissue. The activity may be due to the presence of isostrictinin, strictinin and pedunculagin (*Shoyakugaku Zasshi* 1985, 39, 261; *Chem. Abstr.* 1986, 105, 18202 p).

Isolation of new ellagitannin - guavin B - and its structure determination (*Chem. Pharm. Bull.* 1984, 32, 3787); three new tannins - guavins A, C and D - isolated from leaves and their structures established (*Chem. Pharm. Bull.* 1987, 35, 443); ellagic acid, guaijaverin, quercetin and oleanolic acid isolated from fresh flowers (*Fitoterapia* 1987, 58, 204).

NEW COMPOUNDS

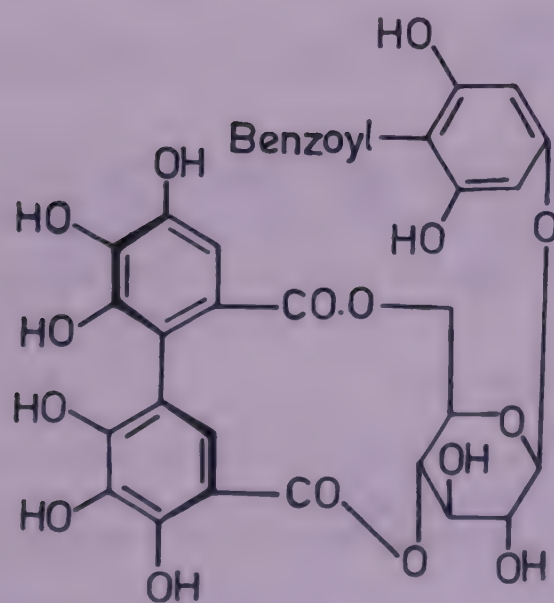


Guavin A

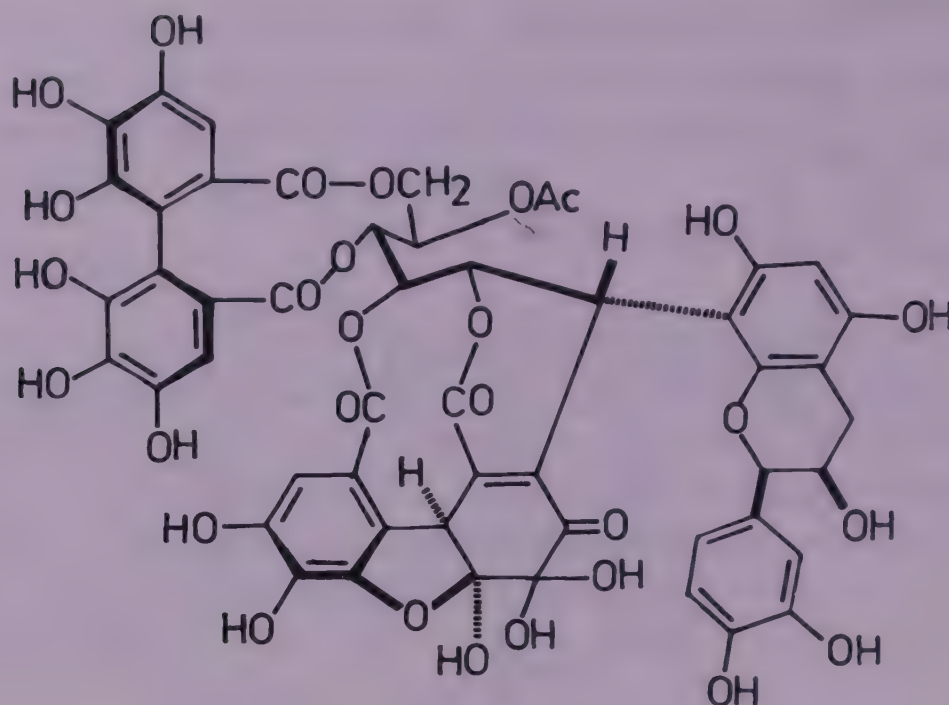
R = H

Guavin C

R = OH



Guavin B

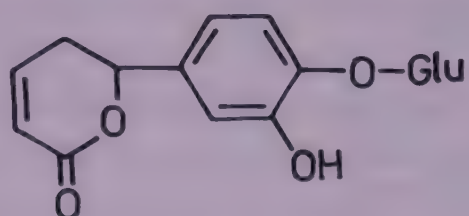


Guavin D

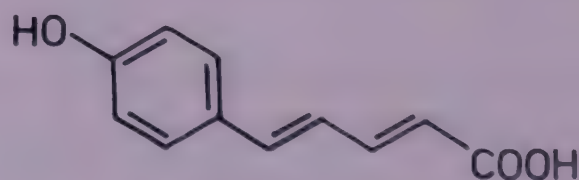
PSILOTUM (Psilotaceae)

P. nudum (L.) P. Beauv. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 534).

A new phenolic glycoside - 3'-hydroxypsilotin - isolated and its structure established (*Phytochemistry* 1985, 24, 2458).

NEW COMPOUNDS

3'-Hydroxypsilotin



Psilotic acid

PSORALEA (Papilionaceae)

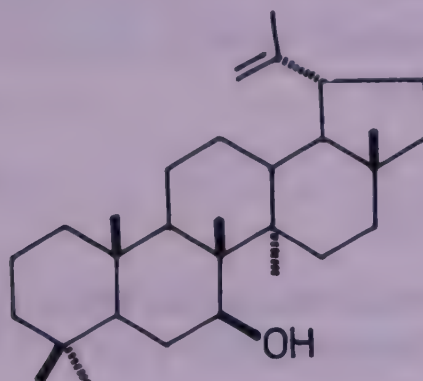
P. corylifolia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 535).

Psoralen synthesised (*Heterocycles* 1987, 26, 2871).

P. plicata Delile (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 568).

A new lupane-type triterpene - psoracinol - isolated and its structure determined (*J. Nat. Prod.* 1989, 52, 749).

NEW COMPOUNDS



Psoracinol

PSYCHOTRIA (Rubiaceae)

P. adenophylla Wall.

Meghalaya - Dieng-mynro-saliang.

Isolation of baurenol, its acetate, betulin, friedelin, ursolic acid and traces of α -amyrin, betulinic acid and β -sitosterol from leaves (*Fitoterapia* 1986, 57, 445).

Distribution : Meghalaya and Andaman Islands.

PTERIS (Pteridaceae)

P. cretica L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 568).

A new ent-kaurane - 12 β -hydroxy-15-oxo-ent-kaur-16-en-19-oic acid- β -D-glucopyranosyl ester - and two new indanone type sesquiterpenes - pterosin S-3-O- β -D-glucoside and pterosin S-3-O- β -D-(4'-caffeoyl)glucoside - isolated and characterised (*Yakugaku Zasshi* 1985, 105, 640; *Chem. Abstr.* 1985, 103, 175378 b).

P. dactylina Hook.

Isolation of 12 β -hydroxy-15-oxo-ent-kaur-16-en-19-oic acid- β -D-glucopyranosyl ester, pterosin S-3-O- β -D-glucoside and its 4'-caffeoyl derivative (*Yakugaku Zasshi* 1985, 105, 640; *Chem. Abstr.* 1985, 103, 175378 b).

Distribution : Eastern Himalayas, alt. 1300-1800 m.

P. grevilleana Wall. ex Agardh

Isolation of 12 β -hydroxy-15-oxo-ent-kaur-16-en-19-oic acid- β -D-glucopyranosyl ester, pterosin S-3-O- β -D-glucoside and its 4'-caffeoyl derivative (*Yakugaku Zasshi* 1985, 105, 640; *Chem. Abstr.* 1985, 103, 175378 b).

Distribution : Eastern Assam.

P. tremula R.Br.

12 β -Hydroxy-15-oxo-ent-kaur-16-en-19-oic acid- β -D-glucopyranosyl ester, pterosin S-3-O- β -D-glucoside and its 4'-caffeoyl derivative isolated (*Yakugaku Zasshi* 1985, 105, 640; *Chem. Abstr.* 1985, 103, 175378 p).

Distribution : South India.

PTEROCARPUS (Papilionaceae)

P. dalbergioides Roxb. syn. *P. indicus* Baker (non Willd.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 537).

A nondialysable polyphenolic compound isolated from bark inhibited plasmin esterolytic activity at ED₅₀ (2.5 μ g/ml) and also showed carcinostatic effect on mice bearing ascites Ehrlich carcinoma at a dose of 2.0 mg/kg (*Agric. Biol. Chem.* 1986, 50, 569).

P. indicus Willd.; see *P. dalbergioides* Roxb.

P. macrocarpus Kurz

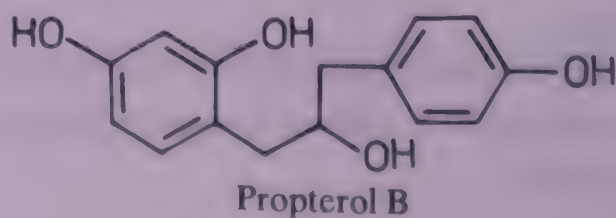
A new isoflavanone C-glucoside - macrocarposide - isolated from heartwood and characterised as 5,7,2',4'-tetrahydroxyisoflavanone-6-C-glucoside; β -sitosterol, pterostilbene, pterocarpol, isoliquiritigenin and liquiritigenin also isolated (*Planta Med.* 1986, 52, 315).

Distribution : Introduced into India in botanic gardens.

P. marsupium Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 537).

Propterol B isolated and its structure determined (*Phytochemistry* 1984, 23, 1814); heartwood afforded liquiritigenin, oleanolic acid, pterostilbene and 4,2',4'-trihydroxychalcone (*J. Indian Chem. Soc.* 1984, 61, 728); isolation of (-)epicatechin from bark (*Planta Med.* 1985, 51, 56); isolation of 8-C- β -D-glucopyranosyl-3,7,4'-trihydroxy- and 3,7,3',4'-tetrahydroxyflavones and 3'-C- β -D-glucopyranosyl- α -hydroxydihydrochalcone from heartwood (*Phytochemistry* 1987, 26, 531); two new flavanone glycosides isolated from roots and characterised as 7-hydroxy-6,8-dimethylflavanone-7-O- α -L-arabinopyranoside and 7,8,4'-trihydroxy-3',5'-dimethoxyflavanone-4'-O- β -D-glucopyranoside (*Z. Naturforsch.* 1988, 43C, 184; *Chem. Abstr.* 1988, 109, 35263 j); a new flavonoid - retusin-8-O- α -L-arabinopyranoside - isolated along with lupeol and naringenin (*Planta Med.* 1988, 54, 371).

NEW COMPOUNDS



BIOLOGICAL ACTIVITY

(-)Epicatechin showed positive chronotropic and inotropic effects on isolated frog heart which were blocked by propranol. In higher dose it caused hyperglycaemia in rats and this effect was also blocked by propranol (*Planta Med.* 1985, 51, 56).

PTEROLOBIUM (Caesalpiniaceae)

P. hexapetalum (Roth) Sant. & Wagh syn. *P. indicum* A. Rich.

Tel. - Walekaduda.

Methyl gallate, methyl tri-O-methylgallate, phenanthrene, pterostilbene, resveratrol and tri-O-methylresveratrol isolated from stems (*Phytochemistry* 1988, 27, 3625).

Distribution : South India.

P. indicum A. Rich.; see *P. hexapetalum* (Roth) Sant. & Wagh

PTEROSPERMUM (Sterculaceae)

P. acerifolium (L.) Willd. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 571).

Bauerenol, betulin, friedelin, kaempferol-3 β -D-galactoside, β -sitosterol, luteolin, its 7 β -D-glucoside and 7 β -D-glucuronide isolated from leaves (*Fitoterapia* 1988, 59, 348).

P. canescens Roxb.; see *P. suberifolium* (L.) Lamk.

P. heyneanum Wall. ex W. & A.; see *P. xylocarpum* (Gaertn.) Sant. & Wagh

P. lanceaefolia Roxb.

Assam - Bon-nohor, Bon baguri; B. - Ban kalla; Khasi - Dieng-nor-sha, Dieng-pen-swang; Nep. - Singani.

Kaempferol (0.30), quercetin (0.27%), friedelin, scopoletin and β -sitosterol present in leaves and quercetin (2.0), kaempferol (0.38%), α -amyrin, bauerenol and its acetate, betulin, friedelin, epifriedelinol, lupeol, β -sitosterol and taraxerone identified in flowers (*Fitoterapia* 1988, 59, 348).

Distribution : Sub-Himalayan tracts and in Assam, Manipur and Meghalaya, ascending to 1200 m in hills. Also planted in plains of Punjab and West Bengal.

P. semisagittatum Buch.-Ham. ex Roxb.

Lushai - Mukare.

Identification of cyclopropenoid fatty acids (16.0%) in seeds; kaempferol (0.12), luteolin (0.11), quercetin (0.10%), α -amyrin, β -amyrin, bauerenol and its acetate, β -sitosterol and

taraxerone present in leaves and kaempferol (0.08%), bauerenol, β -sitosterol and taraxerone in flowes (*Fitoterapia* 1988, 59, 348).

Distribution : Planted in Bihar, West Bengal, Orissa and Tamil Nadu in plains.

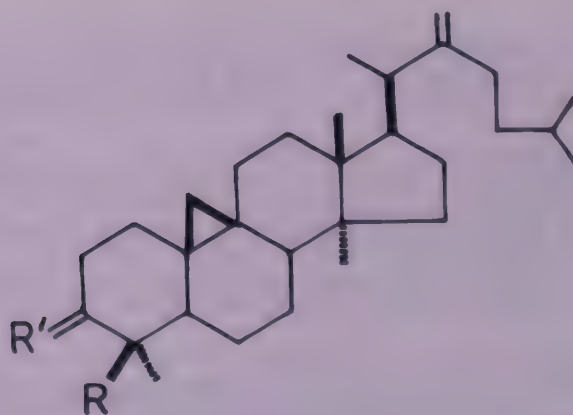
P. suberifolium (L.) Lamk. syn. *P. canescens* Roxb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 572).

Cyclopropenoid fatty acids (17.0%), β -amyrin, bauerenol acetate and betulin identified in seeds whereas leaves afforded β -amyrin, bauerenol, betulin, friedelin, kaempferol, its 3β -D-galactoside, quercetin, its 3-O-arabinoside and 3-O-rhamnoside, β -sitosterol and taraxerone (*Fitoterapia* 1988, 59, 348).

P. xylocarpum (Gaertn.) Sant. & Wagh syn. *P. heyneanum* Wall. ex W. & A. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 572).

New triterpenes - cyclopterospermol, 30-norcyclopterospermol and 30-norcyclopterospermone - isolated from heartwood and their structures determined; n-octacosanol, 3-hydroxy-5-methoxy-2-methylbenzoquinone, sitosterol and its glucoside also isolated (*Phytochemistry* 1987, 26, 2805); isolation of cyclopropenoid fatty acids (14.0%) from seeds and of bauerenol, betulin, friedelin, kaempferol and its 3β -D-galactoside, lupeol, lupeol acetate, lupanone, quercetin- 3β -D-galactoside, β -sitosterol, taraxerone and taraxerol from leaves (*Fitoterapia* 1988, 59, 348; *J. Indian Chem. Soc.* 1988, 65, 147); bark afforded aurantiamide acetate, friedelin, β -sitosterol, its 3-O- β -D-glucoside, taraxerone, taraxerol and an α,β -unsaturated ketosterol (*J. Indian Chem. Soc.* 1988, 65, 147).

NEW COMPOUNDS



Cyclopterospermol

R = Me, R' = α -H, β -OH

30-Norcyclopterospermol

R = H, R' = α -H, β -OH

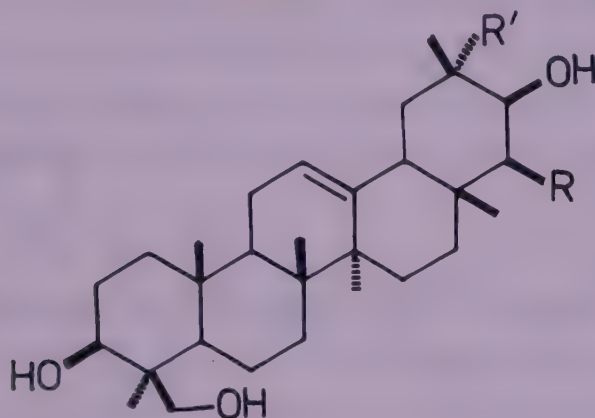
30-Norcyclopterospermone

R = H, R' = O

PUERARIA (Papilionaceae)

P. lobata (Willd.) Ohwi (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 572).

Three new sapogenols - kudzusapogenol A, kudzusapogenol B as ester and kudzusapogenol C - along with cantoniensistriol, sophoradiol, soyasapogenols A and B isolated by methanolysis of crude saponin from roots; structures of new compounds elucidated (*Chem. Pharm. Bull.* 1985, 33, 1293).

NEW COMPOUNDS

Kudzusapogenol A

R = OH, R' = CH₂OH

Kudzusapogenol B

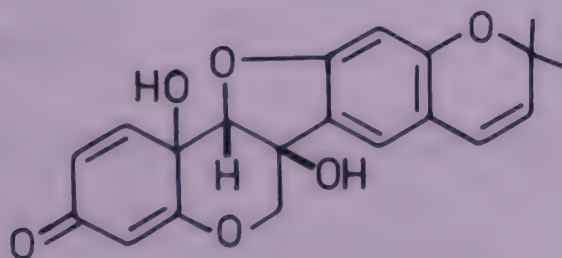
R = OH, R' = COOH

Kudzusapogenol C

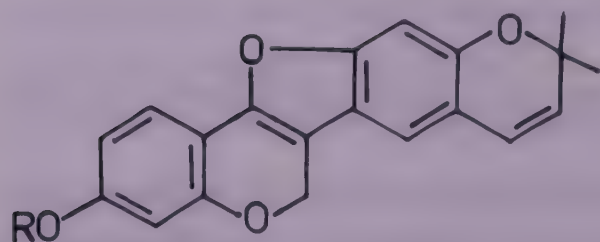
R = H, R' = Me

P. tuberosa (Roxb. ex Willd.) DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 572).

A new pterocarpanone - hydroxytuberosone - isolated from tubers and its structure determined (*Indian J. Chem.* 1984, 23B, 1165); isolation of two pterocarpenes - anhydro-tuberosin and 3-O-methylanhydrotuberosin - and a coumestan - tuberostan - from tubers and their characterisation (*Indian J. Chem.* 1985, 24B, 236); a new isoflavone - puerarone - and a coumestan - puerarostan - isolated from tubers and their structures established (*Indian J. Chem.* 1988, 27B, 285).

NEW COMPOUNDS

Hydroxytuberosone

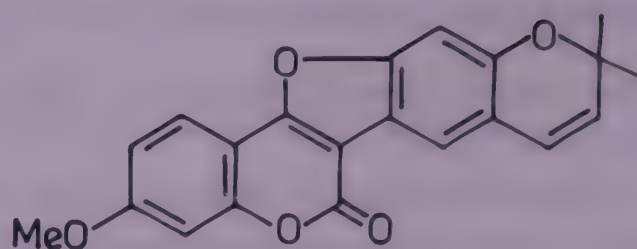


Anhydrotuberosin

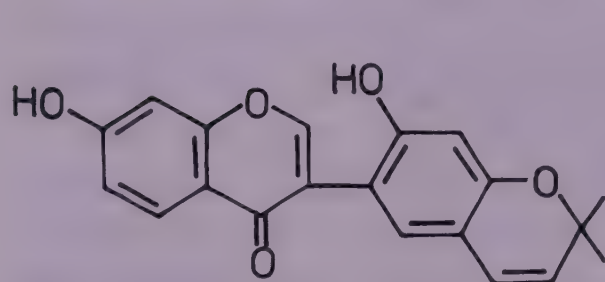
R = H

3-O-Methylanhydrotuberosin

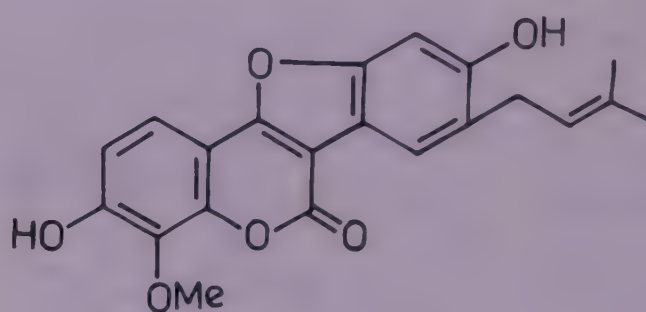
R = Me



Tuberostan



Puerarone



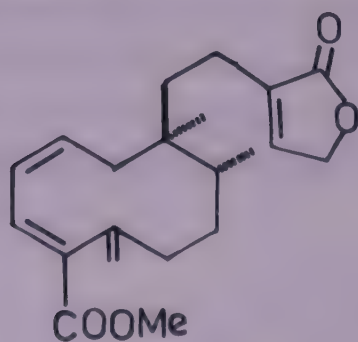
Puerarostan

PULICARIA (Asteraceae)*P. angustifolia* DC.

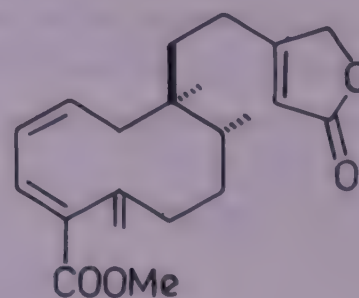
H. - Saneli.

Three derivatives of seco-nidoresedic acid (I, II, III) and methyl-5 α -hydroxyconyscabraoate isolated and characterised; lupeol, lupeyl acetate, sitosterol, stigmasterol and taraxasteryl acetate also isolated (*Phytochemistry* 1985, 24, 190; *Fitoterapia* 1988, 59, 333).

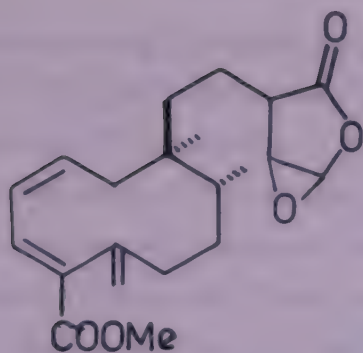
Distribution : Plains of Uttar Pradesh, Bihar and Rajasthan.

NEW COMPOUNDS

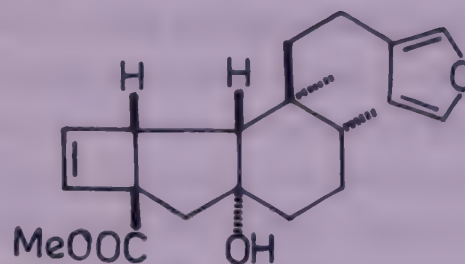
I



II



III

Methyl 5 α -Hydroxyconyscabroate

P. crista (Forsk.) Benth. & Hook. syn. *Francoeuria crista* Cass. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 539).

Isolation of 2 α -hydroxyalantolactone from aerial parts (*J. Nat. Prod.* 1984, 47, 1013); 2 α -hydroxy-5 α ,6 α -epoxyalantolactone isolated and synthesised; axillarin also isolated (*J. Nat. Prod.* 1988, 51, 621).

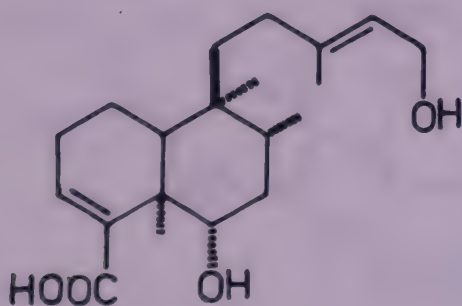
BIOLOGICAL ACTIVITY

2 α -Hydroxyalantolactone showed weak activity against murine P-388 lymphocytic leukaemia (*J. Nat. Prod.* 1988, 47, 1013); 2 α -hydroxy-5 α ,6 α -epoxyalantolactone and axillarin exhibited antineoplastic and cytotoxic activities (*J. Nat. Prod.* 1988, 51, 621).

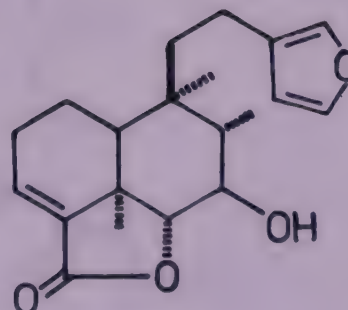
P. salviaefolia Bunge (*salviifolia*)

Isolation and structure elucidation of a new diterpene - salvinin - from aerial parts; salvin and hardwickiic acid also isolated (*Khim. Pri. Soedin.* 1985, 201; *Chem. Abstr.* 1985, 103, 119922 n); another new diterpenoid - salvicin - isolated from aerial parts together with rutin and its structure established (*Khim. Pri. Soedin.* 1986, 299; *Chem. Abstr.* 1986, 105, 168911 h).
Distribution : Kashmir.

NEW COMPOUNDS



Salvicin



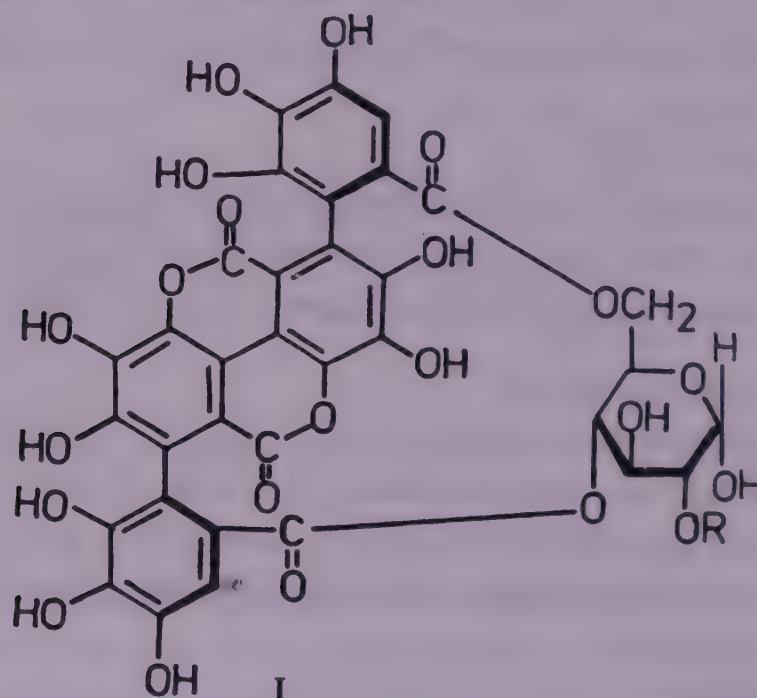
Salvinin

PUNICA (Punicaceae)

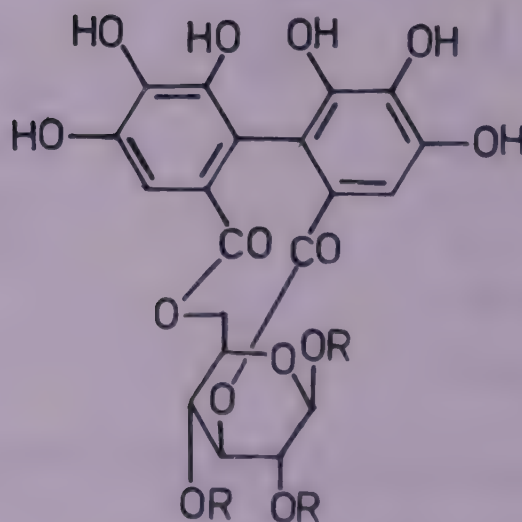
P. granatum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 540).

Isolation of cyanidin-3-glucoside and -3,5-diglucoside, delphinidin-3-glucoside and -3,5-diglucoside from seed coat (*Riv. Merceol.* 1984, 23, 247; *Chem. Abstr.* 1985, 102, 75698 s); punicafolin isolated from leaves and characterised as 1,2,4-O-galloyl-3,6(R)-hexahydroxydiphenoyl- β -D-glucose; granatin A, granatin B, corilagin, strictinin, 1,2,4,6-tetra-O-galloyl- β -D-glucose and 1,2,3,4,6-penta-O-galloyl- β -D-glucose also isolated (*Phytochemistry* 1985, 24, 2075); a new hydrolysable tannin-2-O-galloyl-4,6(S,S)-galloyl-D-glucose (I) - isolated and characterised; structures of punicalin and punicalagin revised (*Chem. Pharm. Bull.* 1986, 34, 650); determination of punicic (33.3), nonadecanoic (5.9), heneicosanoic (5.0), tricosanoic (4.9) and 13-methylstearic (1.5), 4-methylauric (0.5%) acids in seed oil by GC (*Acta Pharm. Jugosl.* 1986, 36, 63; *Chem. Abstr.* 1986, 105, 102404 p).

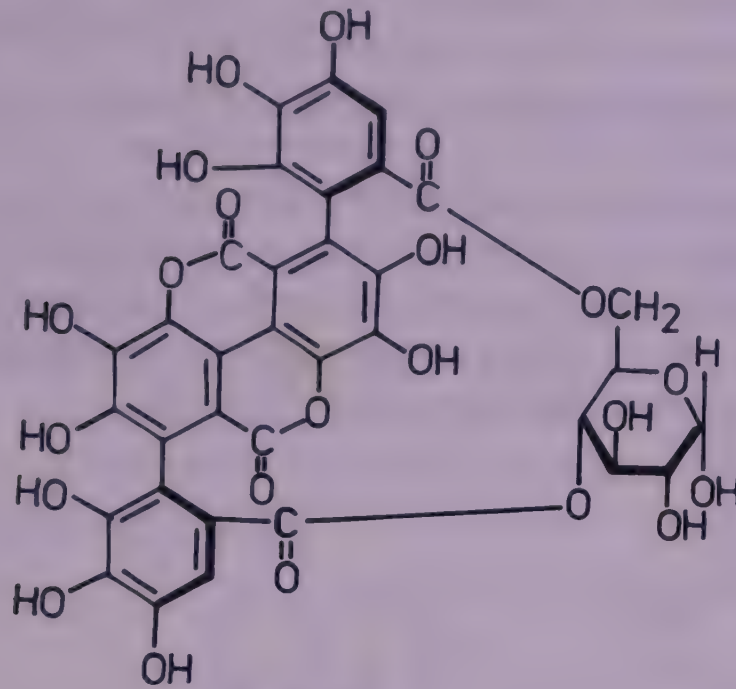
NEW COMPOUNDS



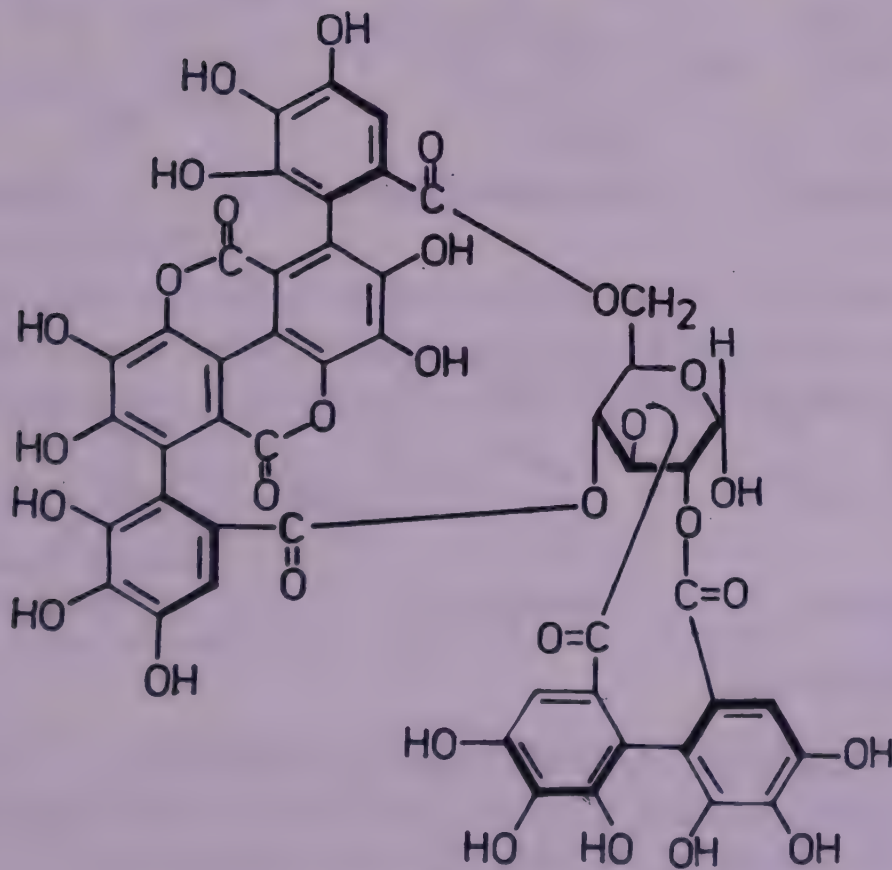
R = Galloyl



R = Galloyl



Punicalin



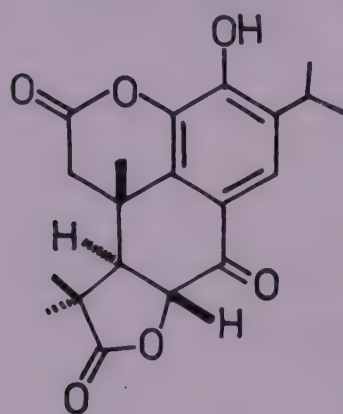
Punicalagin

PYGMAEOPREMNA (Verbenaceae)

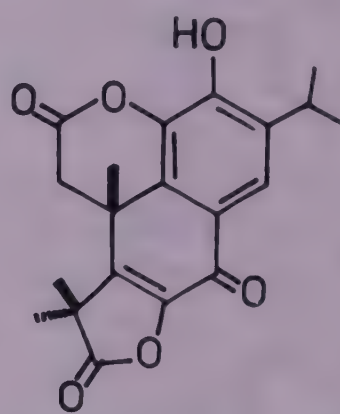
P. herbacea (Roxb.) Moldenke syn. *Premna herbacea* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 541).

Two new diterpenoids - pygmaeocin A and 5,6-didehydropygmaeocin A - isolated from roots together with sugiol and their structures established (*J. Nat. Prod.* 1989, 52, 581); isolation of another new diterpenoid - pygmaeocin E - from roots and its structure elucidation (*Phytochemistry* 1988, 27, 1151); a new 6-oxygenated coumarin - pygmaeoherin - isolated from roots and its structure determined (*Planta Med.* 1988, 54, 48); isolation and structure elucidation of a new diterpenoid - sirutekkone - from roots (*Phytochemistry* 1988, 27, 2249); structure of bharangin isolated earlier from roots and found to be identical with that of sirutekkone (*Tetrahedron Lett.* 1988, 29, 245); a new quinomethide - isobharangin - isolated from root nodules and characterised (*Tetrahedron Lett.* 1989, 30, 867).

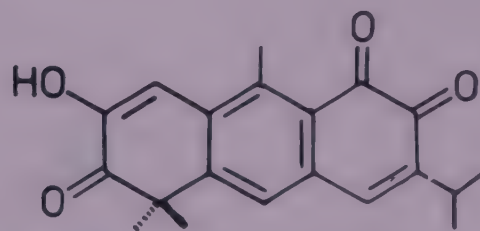
NEW COMPOUNDS



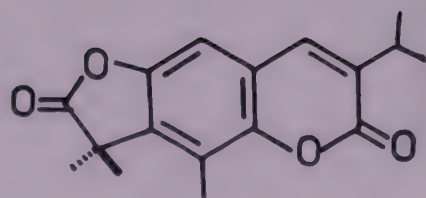
Pygmaeocin A



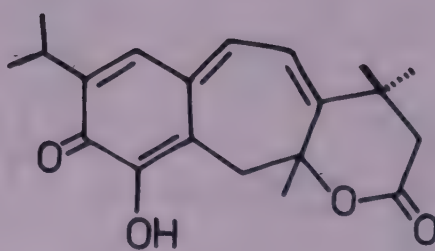
5,6-Didehydropygmaeocin A



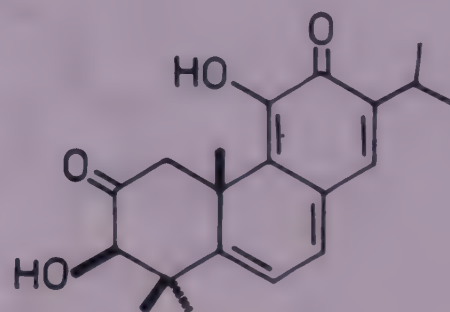
Pygmaeocine E



Pygmaeoherin



Sirutekkone



Isobharangin

PYRROSIA (Polypodiaceae)

P. lingua (Thunb.) Farwell syn. *Niphobolus heteractis* sensu Bedd. p.p.

Chlorogenic acid, kaempferol, quercetin, isoquercetin, β -sitosterol, sucrose and trifolin isolated (*Zhiwu Xuebao* 1986, 28, 339; *Chem. Abstr.* 1986, 105, 130721 h).

Distribution : North-east India.

PYRUS (Rosaceae)

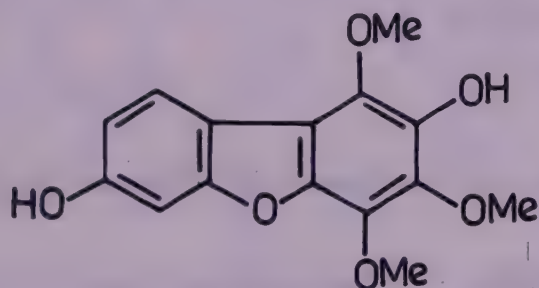
P. aucuparia Gaertn.; see *Sorbus aucuparia* L.

P. baccata L.; see *Malus baccata* (L.) Borkh.

P. communis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 542).

A new dibenzofuran - γ -pyrufuran - isolated from wood of plant infected with *Chondrostereum purpureum* and its structure elucidated (*J. Chem. Soc. Perkin 1* 1984, 1441); structures of gibberellins A45 and A63 established by partial synthesis (*J. Chem. Soc. Perkin 1* 1985, 651); twigs afforded arbutin, betulin, betulinic acid, daucosterol, hydroquinone, lupeol, nonacosane and β -sitosterol (Zhiwu Xuebao 1987, 29, 84; *Chem. Abstr.* 1987, 106, 172972 s); 3-O-(6''-O-malonyl)- β -D-glucosides of kaempferol, isorhamnetin, quercetin and 3,5-dicaffeoylquinic acid isolated (*Phytochemistry* 1989, 28, 663).

NEW COMPOUNDS



γ -Pyrufuran

BIOLOGICAL ACTIVITY

Lupeol, β -sitosterol, betulin, betulinic acid, hydroquinone and arbutin possessed bacteriostatic activity against *Escherichia coli*, *Salmonella typhi*, *Shigella flexneri* and *Staphylococcus aureus* (Zhiwu Xuebao 1987, 29, 84; *Chem. Abstr.* 1987, 106, 172972 s).

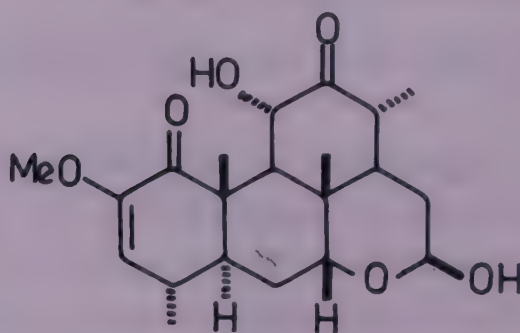
P. malus L.; see *Malus pumila* Mill.

QUASSIA (Simaroubaceae)

Q. amara L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 543).

Three alkaloids - 1-vinyl-4,8-dimethoxy- β -carboline, 1-methoxycarbonyl- β -carboline and 3-methylcanthin-2,6-dione - isolated from wood and characterised (*Planta Med.* 1987, 53, 289); isolation of a new quassinoid - 11-dihydro-12-norneoquassin - from wood and its structure elucidation; quassin, neoquassin, paraine and isoparaine also isolated (*Phytochemistry* 1987, 26, 3085).

NEW COMPOUNDS



11-Dihydro-12-norneoquassin

BIOLOGICAL ACTIVITY

Simalikalactone D (0.0009 $\mu\text{g/ml}$) *in vitro* caused 50% inhibition of incorporation of ^3H -hypoxanthine into *Plasmodium falciparum* (*Antimicrob. Agents Chemother.* 1986, 30, 101; *Chem. Abstr.* 1986, 105, 107945 a).

QUERCUS (Fagaceae)

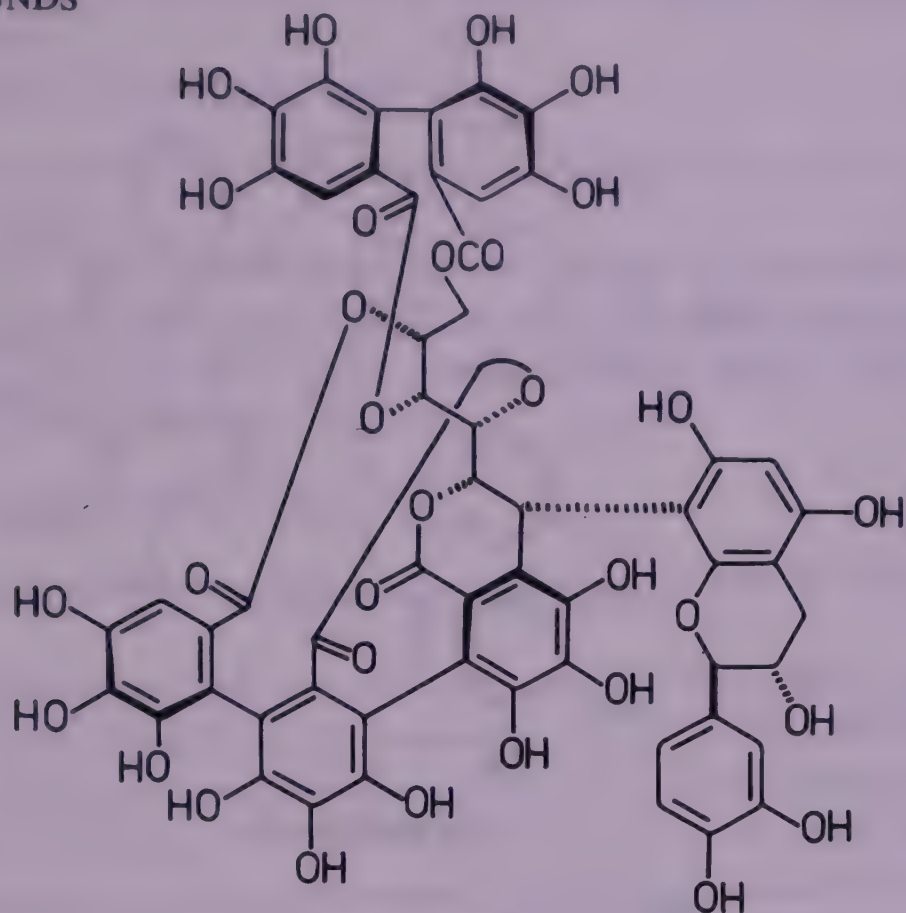
Q. acutissima Carruth. syn. *Q. serrata* sensu Hook.f. (non Thunb.)

Assam - Dingritiang.

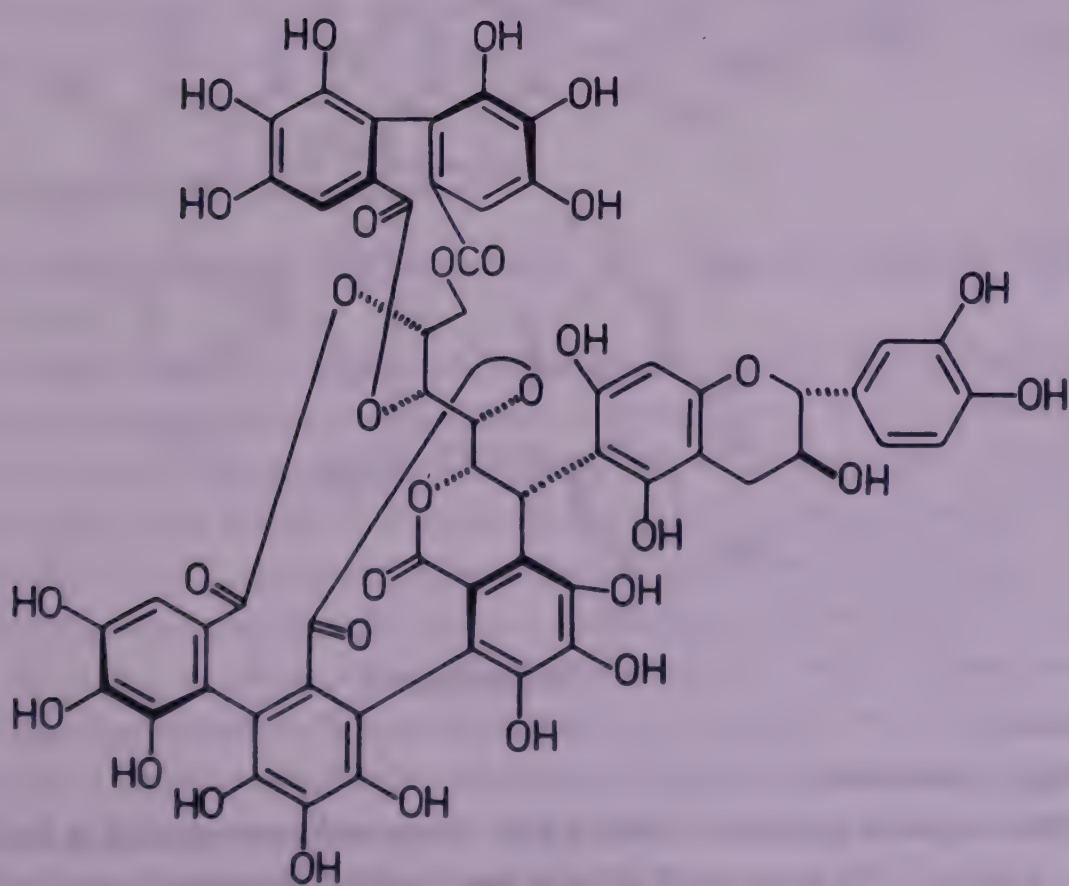
Seven phenolic glucosides - D-threo-guaiacylglycerol-8-O- β -D-(6'-O-galloyl)glucopyranoside, L-threo-guaiacylglycerol-8-O- β -D-(6'-O-galloyl)glucopyranoside, 3-methoxy-4-hydroxyphenol-1-O- β -D-(6'-O-galloyl)glucopyranoside, gentisic acid-5-O- β -D-(6'-O-galloyl)glucopyranoside, 3,5-dimethoxy-4-hydroxyphenol-1-O- β -D-(6'-O-galloyl)glucopyranoside, cis-coniferyl alcohol-4-O- β -D-(6'-O-galloyl)glucopyranoside and 3,4,5-trimethoxyphenol-1-O- β -D-(6'-O-galloyl)glucopyranoside isolated from bark (*Phytochemistry* 1987, 26, 1147); isolation of two new tannins - acutissimins A and B - and their characterisation (*Chem. Pharm. Bull.* 1987, 35, 602); another two new tannins - mongolicains A and B - isolated from bark and their structures established (*Chem. Pharm. Bull.* 1988, 36, 857).

Distribution : Himalayas from Kumaon eastwards to Nepal, Sikkim, Bhutan, Khasia Hills and Manipur, alt. 900-1800 m.

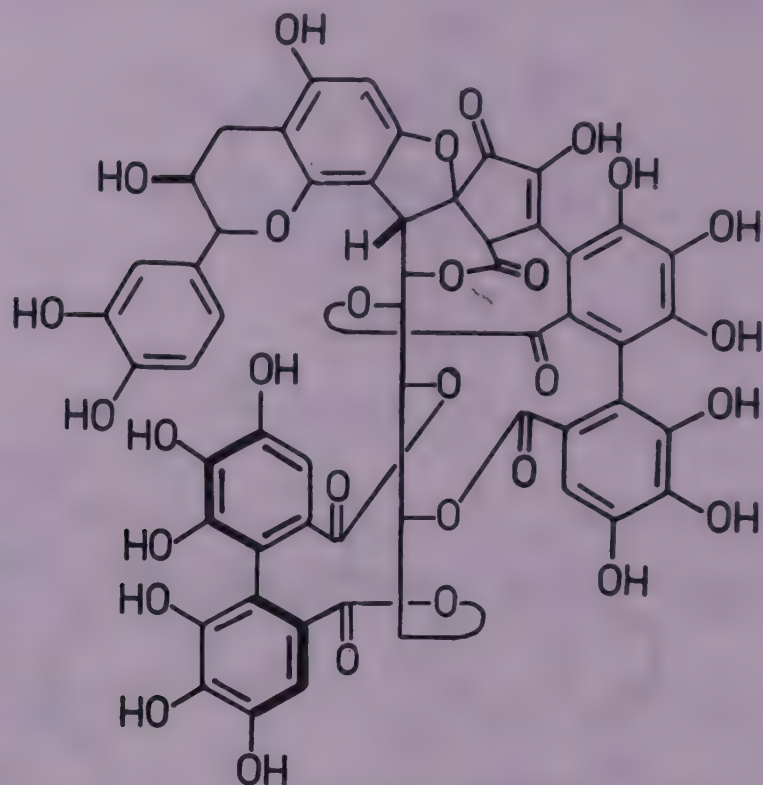
NEW COMPOUNDS



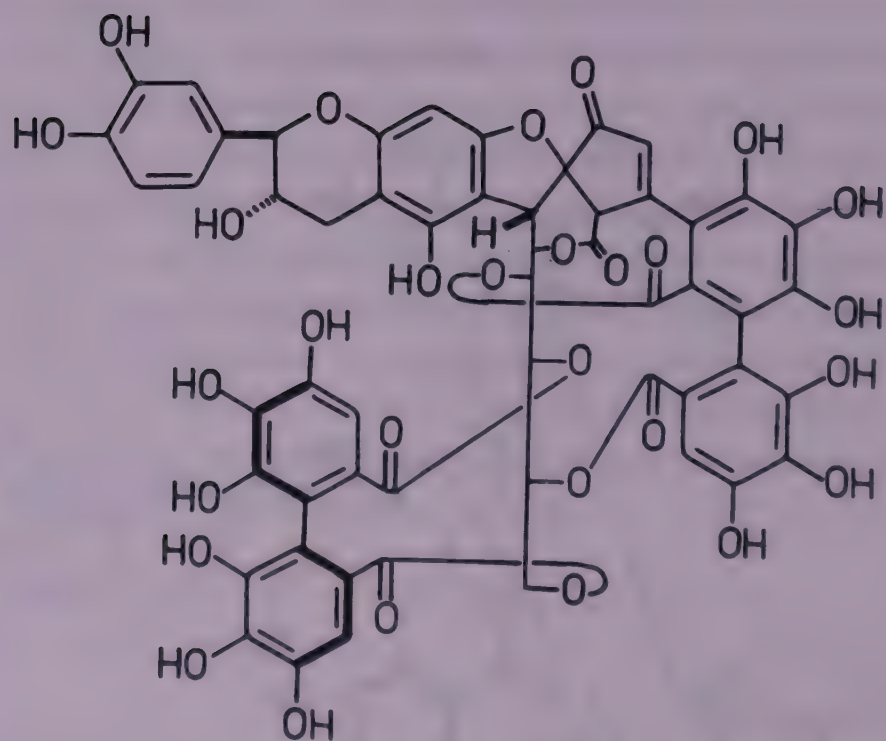
Acutissimin A



Acutissimin B



Mongolicain A



Mongolicain B

Q. cerriss L.

Eng. - Turkish oak.

Three acylated glycosides isolated from leaves and characterised as kaempferol-3-O-(4''-O-acetyl-6''-O-p-coumaroyl)- β -D-glucopyranoside, isorhamnetin-3-O-(6''-O-galloyl)-

β -D-glucopyranoside and isorhamnetin-3-O-(6''-O-p-coumaroyl)- β -D-glucopyranoside (*Ann. Chem.* 1988, 989).

Distribution : Reported to be growing in Nilgiris.

Q. ilex L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 543).

Isolation of a new acylated astragalin - kaempferol-3-O- β -D-(3'',6''-di-O-acetyl-2'',4''-di-O-p-coumaroyl)glucopyranoside - from leaves (*Ann. Chem.* 1984, 1864); another acylated astragalin - kaempferol-3-O- β -D-(2'',6''-di-O-p-coumaroyl)glucopyranoside - from leaves and its structure elucidation (*Ann. Chem.* 1984, 1867).

Q. serrata Thunb.; see *Q. acutissima* Carruth.

Q. suber L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 576).

Holocellulose obtained from cork contained glucose (68.45), xylose (20.67), arabinose (5.52), mannose (3.52), galactose (1.83%) and rhamnose (traces) (*J. Nat. Prod.* 1987, 50, 811); polysaccharide B-2 consisting of xylose, arabinose glucose, galactose, 4-O-methylglucuronic acid and rhamnose in molar ratio of 17:12:12:6:4:1 isolated from cork (*Can. J. Chem.* 1988, 66, 449); another polysaccharide containing xylose and 4-O-methylglucuronic acid in molar ratio of 50:1 and glucose, galactose, mannose, rhamnose and arabinose in traces isolated from cork (*J. Nat. Prod.* 1988, 51, 488); betulin-3-cafeate isolated from cork waste along with betulin, betulinic acid and betulonic acid and its structure determined by ^{13}C -NMR (*J. Nat. Prod.* 1988, 51, 217).

QUILLAJA (Rosaceae)

Q. saponaria Molina (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 337).

A new saponin - quillinin A - isolated from wood and bark together with quillaic acid and gypsogenin; new compound partially characterised (*Fitoterapia* 1985, 56, 254); a triterpenoid saponin mixture named quillajasaponin isolated from bark; its alkaline hydrolysis afforded two desacylsaponins, DS-1 and DS-2, characterised as 3-O- β -D-galactopyranosyl(1 \rightarrow 2)-[β -D-xylopyranosyl(1 \rightarrow 3)]- β -D-glucuronopyranosyl quillaic acid derivatives bearing 28-O- β -D-apiofuranosyl(1 \rightarrow 3)- β -D-xylopyranosyl(1 \rightarrow 4)- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-fucopyranoside and 28-O- β -D-apiofuranosyl(1 \rightarrow 3)- β -D-xylopyranosyl(1 \rightarrow 4)-[β -D-glucopyranosyl(1 \rightarrow 3)]- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-fucopyranoside moieties respectively (*Phytochemistry* 1987, 26, 229); three acyl moieties obtained by alkaline hydrolysis of quillajasaponin, identified as 3,5-dihydroxy-6-methyloctanoic acid, its 5-O- α -L-arabinofuranoside and 5-O- α -L-rhamnopyranosyl(1 \rightarrow 2)- α -L-arabinofuranoside (*Phytochemistry* 1987, 26, 2357).

RABDOSIA (Lamiaceae)

R. coetsa (Buch.-Ham. ex D.Don) Hara; see *Plectranthus japonicus* (Burm.f.) Koidz. var. *japonicus*

R. lophanthoides (Buch.-Ham. ex D.Don) Hara; see *Plectranthus lophanthoides* (Buch.-Ham. ex D.Don) Grierson & Long

R. lophanthoides (Buch.-Ham. ex D.Don) Hara var. *gerardiana* (Benth.) Hara; see *Plectranthus lophanthoides* (Buch.-Ham. ex D.Don) Grierson & Long var. *gerardianus* (Benth.)

R. stracheyi (Benth. ex Hook.f.) Hara; see *Plectranthus stracheyi* Benth. ex Hook.f.

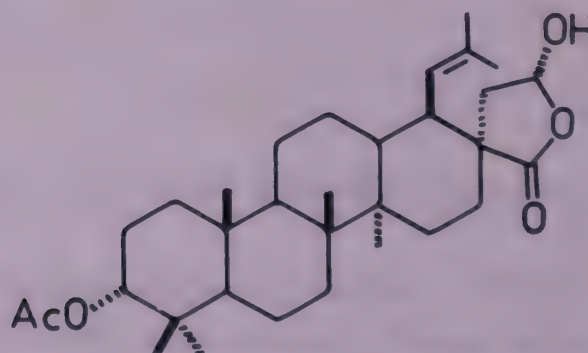
RADERMACHERA (Bignoniaceae)

R. borii Fischer; see *R. sinica* (Hance) Hemsl.

R. sinica (Hance) Hemsl. syn. *R. borii* Fischer (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 544).

Plant extract (50.0 mg/kg/day) showed significant antileukaemic activity in P-388 leukaemia.

A new triterpene - radermasinin - isolated and its stereostructure determined by X-ray analysis (*Chem. Commun.* 1986, 1397).

NEW COMPOUNDS

Radermasinin

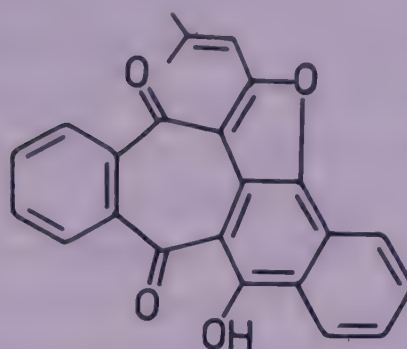
BIOLOGICAL ACTIVITY

Radermasinin and its acetyl derivative demonstrated significant cytotoxicity in KB cell culture, their ED₅₀ being 3.3 µg/ml and 3.5 µg/ml respectively (*Chem. Commun.* 1986, 1397).

R. xylocarpa (Roxb.) K. Schum. syn. *Stereospermum xylocarpum* Benth. & Hook.f. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 577).

Isolation of a new pigment - radermachol - from roots and its structure elucidation by X-ray analysis (*Tetrahedron Lett.* 1984, 25, 5847).

NEW COMPOUNDS



Radermachol

RANDIA (Rubiaceae)

R. dumetorum Lamk.; see *Xeromphis spinosa* (Thunb.) Keay

R. tetrasperma (Roxb.) Benth. & Hook.f. ex Brandis (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 577).

Isolation of scopoletin, its β -D-galactoside, β -sitosterol, its glucoside, oleanolic acid and mannitol from fruits (*Pharmazie* 1988, 43, 657; *Chem. Abstr.* 1989, 110, 54483 t).

R. uliginosa DC.; see *Xeromphis uliginosa* (Retz.) Maheshwari

RAPHANUS (Brassicaceae)

R. sativus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra. PID, New Delhi, 1993, p. 545).

Isolation of stearic acid and β -sitosterol from seeds (*Shaanxi Xinyiyao* 1984, 13, 54; *Chem. Abstr.* 1985, 102, 163686 s); 2-O-(p-coumaroyl)-, 2-O-caffeoyl- and 2-O-feruloyl-malates isolated from leaves and inflorescences (*Phytochemistry* 1984, 23, 1741); sinapine, a hypotensive compound, identified in seeds (*Zhongcaoyao* 1987, 18, 101; *Chem. Abstr.* 1987, 107, 102509 t).

RAUVOLFIA (Apocynaceae)

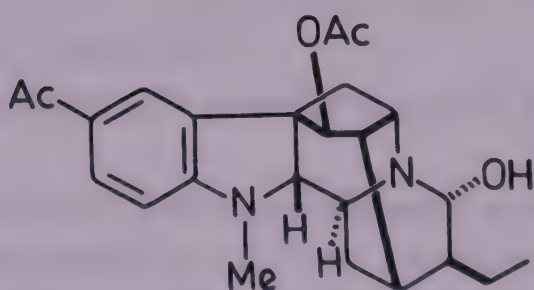
R. serpentina (L.) Benth. ex Kurz (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 546).

Extract exhibited activity against vesicular stomatitis virus in monkey cell culture (*Ann. Pharm. Fr.* 1986, 44, 41; *Chem. Abstr.* 1986, 105, 108018 n).

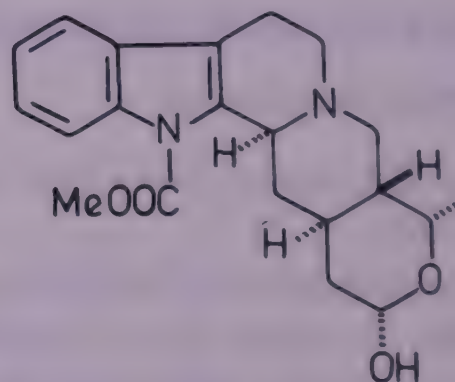
Enantioselective synthesis of (-)-ajmalicine (*Chem. Common.* 1984, 715; *Tetrahedron Lett.* 1985, 26, 865); total synthesis of reserpine (*J. Am. Chem. Soc.* 1985, 107, 4072; *ibid.* 1987, 109, 6124); α -yohimbine also synthesised totally (*J. Am. Chem. Soc.* 1987, 109, 6124); a new dihydroindole alkaloid - sandwicoline - from roots and its characterisation as 21-monohydro-

N-methylsandwicine (*Heterocycles* 1985, 23, 617); another dihydroindole alkaloid - sandwicolidine - isolated and its structure established (*Tetrahedron* 1985, 41, 4577); a new yohambanoid - rescinnaminol - from roots and its structure elucidation (*Pakistan J. Sci. Ind. Res.* 1986, 29, 401; *Chem. Abstr.* 1987, 107, 36566 f); another alkaloid - rescinnamidine - from roots of plant grown in Thailand and its characterisation (*J. Nat. Prod.* 1987, 50, 238); isolation of reserpine and ajmalicine from roots (*Bangladesh J. Sci. Ind. Res.* 1987, 22, 169; *Chem. Abstr.* 1989, 110, 132175 k); another alkaloid - ajmalicidine - isolated from roots and its structure established as 1-carbomethoxy-17 α -hydroxy-16-decarbomethoxy-16,17-dihydroajmalicine (*Phytochemistry* 1987, 26, 875); isolation and characterisation of new dihydroindole alkaloid - ajmalinimine - from roots of plant from Thailand (*Heterocycles* 1987, 26, 463); roots of Thailand plant also afforded a new alkaloid - ajmalimine - characterised as 21-trimethoxybenzoylajmaline (*Planta Med.* 1987, 53, 288); new alkaloid - indobinine - from roots and its structure determination (*Indian J. Chem.* 1987, 26B, 279); another alkaloid - indobine - isolated from roots of Thailand plant and its structure established (*Z. Naturforsch.* 1987, 42B, 783; *Chem. Abstr.* 1987, 107, 112691 k); isolation of new yohambanoid - yohambinine - from roots and its characterisation as 5 β -methyl-pseudoyohimbane (*Tetrahedron Lett.* 1987, 28, 1311); sandwicoline synthesised (*Synthesis* 1988, 478; *Chem. Abstr.* 1989, 110, 135551 r).

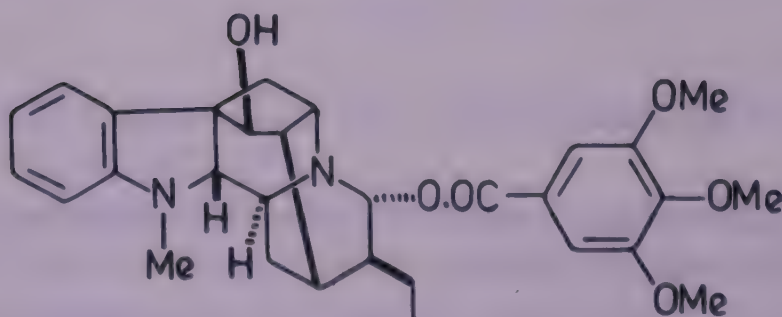
NEW COMPOUNDS



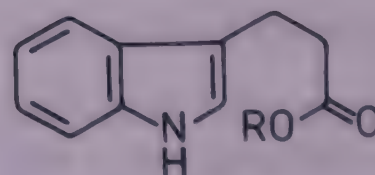
Ajmalinimine



Ajmalicidine



Ajmalimine

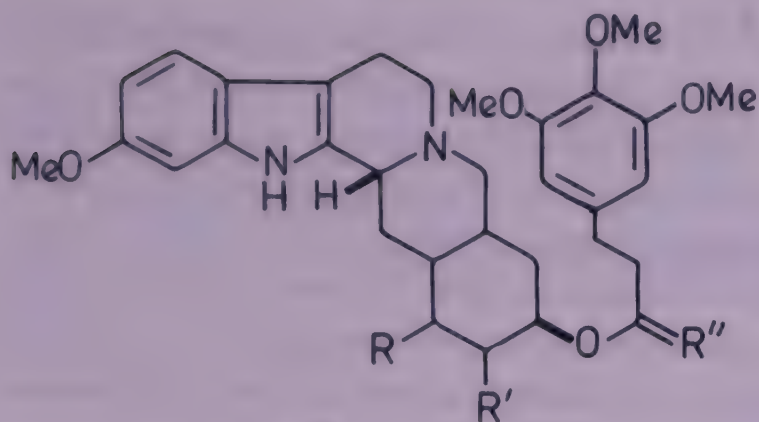


Indobine

R = Benzyl

Indobinine

R = Cyclohexyl

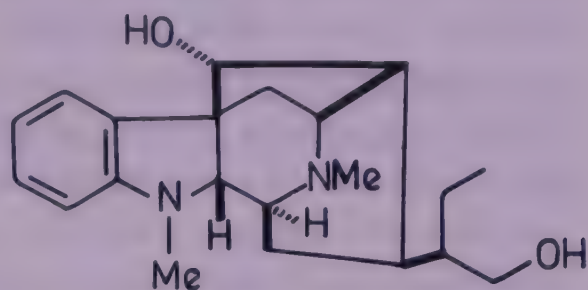


Rescinnaminol

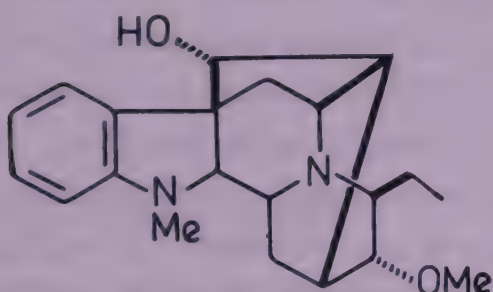
$R, R' = H, R'' = H, OH$

Rescinnamidine

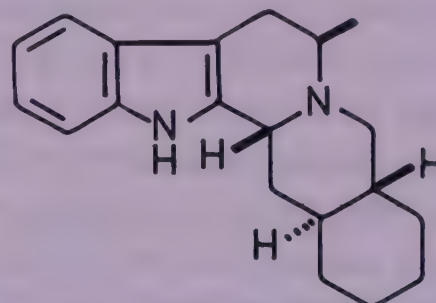
$R = \beta\text{-COOMe}, R' = \alpha\text{-OMe}, R'' = O$



Sandwicoline



Sandwicolidine



Yohambinine

BIOLOGICAL ACTIVITY

Cytological effects of yohimbine and ajmalicine studied on cells of *Allium cepa* roots; both compounds showed reversible mitodepressant effect and possessed differing degrees of clastogenic properties (*Cell. Chromosome Res.* 1983, 6, 59; *Chem. Abstr.* 1985, 102, 72719 p); yohimbine (5.0-10.0 mg/kg, i.p.) elevated seizure threshold in normal mice in a concentration-dependent manner but showed no significant effect on seizure threshold in audiogenic seizure-prone (ASP) mice (*Eur. J. Pharmacol.* 1985, 115, 123); yohimbine showed anticonvulsant activity against maximal electroconvulsions in mice and rats with peak effect at 15-30 min, it decreased ED₅₀ of several anticonvulsants including phenobarbital (*Pharmazie* 1988, 43, 732; *Chem. Abstr.* 1989, 110, 51245 f); yohimbine when administered i.p. once a day for 8 days, increased serum prolactin concentration but when given orally in feed for 7 days, it decreased the concentration. These effects were dependent on dosage and route of administration (*Am. J. Vet. Res.* 1986, 47, 949; *Chem. Abstr.* 1986, 104, 200189 w); yohimbine produced a reversible and concentration-dependent decrease in maximum upstroke velocity and a slight increase in action potential duration in isolated canine ventricular myocytes. It (0.1 mM) reduced upstroke velocity by >90.0%. Studies suggested that yohimbine can produce local anaesthetic effect, primarily due to inhibition of sodium channels (*Eur. J. Pharmacol.* 1986, 127, 125); yohimbine reduced morphine tolerance in longitudinal muscle-myenteric plexus strips

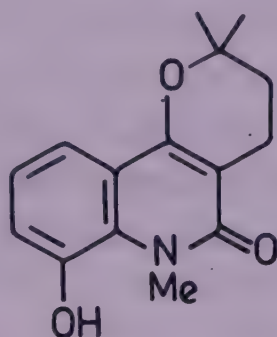
of guinea pig ileum (*Life Sci.* 1987, 40, 155); effects of yohimbine in capsaicin-induced depressor reflex in rat determined; yohimbine (5.0 μ g, intrathecal) given before clonidine abolished inhibitory effect of clonidine on blood pressure response to capsaicin and when given intracisternally it (20.0 μ g) did not change mean blood pressure but showed dual effect on depressor reflex in response to capsaicin injection, a short period of enhanced reflex response followed by a long-lasting inhibition of response (*Brit. J. Pharmacol.* 1988, 94, 848); yohimbine (10.0 mg/kg, p.o.) caused increase in plasma nor-adrenaline and almost no change in plasma glucose and adrenaline in pentobarbital anaesthetised rats. It potentiated urethane-induced elevation in plasma nor-adrenaline but partially inhibited urethane-induced increase in plasma adrenaline and glucose; thus yohimbine inhibited urethane-induced hyperglycaemia via its inhibitory action on adrenaline secretion and also through its blocking action on peripheral α -adrenoceptors (*Jap. J. Pharmacol.* 1989, 49, 523); yohimbine (0.5 mg/kg, i.v.) increased both resting and parasympathetic and sympathetic stimulation-induced submaxillary salivary secretion for a period of 45 min in anaesthetised dogs. Studies indicated that yohimbine increased submaxillary secretion by inhibition of presynaptic α_2 -adrenoceptors located on chorda tympani nerve which inhibited cholinergic transmission (*Brit. J. Pharmacol.* 1989, 98, 101); effect of yohimbine and caffeine investigated in social interaction, elevated plus-maze and punished-drinking tests of anxiety in rats. Yohimbine (2.5 mg/kg, i.p.) was anxiogenic-like in plus-maze and displayed anticonflict activity. Caffeine (40.0 mg/kg, i.p.) had anxiogenic-like effects in social interaction and plus-maze tests. However, caffeine and yohimbine antagonised each other in social interaction and elevated plus-maze tests (*Eur. J. Pharmacol.* 1989, 159, 211).

Administration of reserpine (1.0 mg/kg/day) to rats for 7 days resulted in a marked decrease in a corticosterone-sensitive component of extraneuronal accumulation of (3H)-isoprenaline into their atria. Reserpine *in vitro* did not inhibit extraneuronal uptake. Studies indicated that reserpine-induced change in accumulation of [3H]-isoprenaline was dependent upon functional adrenergic innervation (*Brit. J. Pharmacol.* 1985, 86, 287); effect of reserpine on the contraction of isolated saphenous artery of rabbit by stimulation of sympathetic nerves studied. In vessels exposed to reserpine, substantial contraction was recorded despite a 95.7% reduction in noradrenaline content of tissue (*Brit. J. Pharmacol.* 1987, 92, 871); raubasine inhibited platelet biological activity in patients with marked predisposition to complications of atherosclerosis. Platelet aggregation was inhibited in 85.7% of patients, plasma fibrinogen was reduced in 71.4% and platelet count was increased in most of the patients (*Arzneim. Forsch.* 1986, 36, 1394).

RAVENIA (Rutaceae)

R. spectabilis Engl. syn. *Limonia spectabilis* Lindl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 548).

A quinolone alkaloid - ravesilone - isolated from leaves and its structure determined (*Phytochemistry* 1984, 23, 1825); synthesis of atanine and N-methylatanine (*Tetrahedron* 1984, 40, 4041).

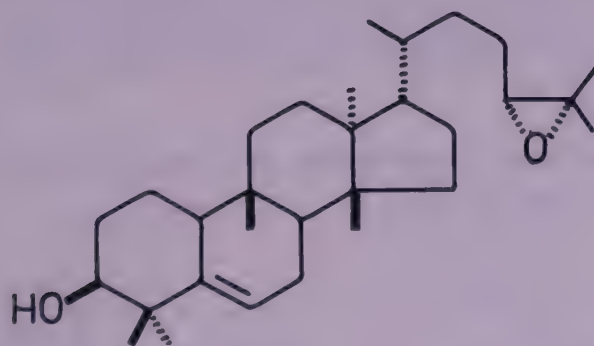
NEW COMPOUNDS

Ravesilone

REISSANTIA (Hippocrateaceae)

R. indica (Willd.) Halle syn. *Pristimera indica* (Willd.) A.C. Smith, *Hippocratea indica* Willd. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 204).

Isolation of a triterpene oxide - reissantioloxide - and its stereostructure determination (*Chem. Commun.* 1988, 249).

NEW COMPOUNDS

Reissantioloxide

RHAMNUS (Rhamnaceae)

R. dahuricus Pallas; see *R. virgatus* Roxb.

R. dahuricus Pallas var. *hirsutus* (Wt. & Arn.) Lawson; see *R. virgatus* Roxb.

R. procumbens Edgew.

Musizin, physcion, emodin, frangulin A, chrysophanol, kaempferide and 7-hydroxy-5-methoxyphthalide isolated and their ¹³C-NMR determined (*J. Indian Chem. Soc.* 1985, 62, 616; *Phytother. Res.* 1988, 2, 51; *Chem. Abstr.* 1988, 109, 66783 h).

Distribution : Himalayas, from Himachal Pradesh to Kumaon in U.P. hills, alt. 2100-2400 m.

BIOLOGICAL ACTIVITY

Emodin exhibited intestinal and cardiac stimulant, central nervous system depressant and analgesic activities in rabbits and guinea pigs, frogs, mice and rats respectively (*Phytother. Res.* 1988, 2, 51; *Chem. Abstr.* 1988, 109, 66783 h); kaempferol (0.2 g/kg, i.p.) exhibited anti-inflammatory activity against carrageenin- and 5-hydroxytryptamine-induced paw oedema in rats. It also inhibited accumulation of pouch fluid and granulation tissue formation induced by croton oil. Kaempferol also showed antiulcer activity against stress-induced gastric ulcers in guinea pigs; it decreased acid and pepsin output and promoted mucus secretion in gastric juice of rats (*Indian J. Exp. Biol.* 1988, 26, 121).

R. triquetra Wall. ex Roxb. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 581).

Physcion, emodin, chrysophanol, β -sitosterol and its glucoside identified (*Fitoterapia* 1988, 59, 78).

BIOLOGICAL ACTIVITY

Kaempferol 7-methyl ether exhibited significant anti-inflammatory activity and a non-specific antispasmodic activity. It caused cardio-stimulation which might be due to an endogenous release of catecholamines (*Fitoterapia* 1989, 60, 273).

R. virgatus Roxb. syn. *R. dahuricus* sensu Lawson (non Pallas); *R. dahuricus* Pallas var. *hirsutus* (Wt. & Arn.) Lawson (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 548).

Isolation of 5-methoxy-7-hydroxyphthalide, 6-O-methylalaterin and maesopsin from stems (*J. Indian Chem. Soc.* 1985, 62, 411).

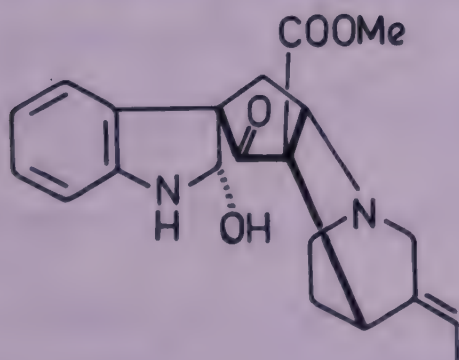
RHAZYA (Apocynaceae)

R. stricta Decne. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 548).

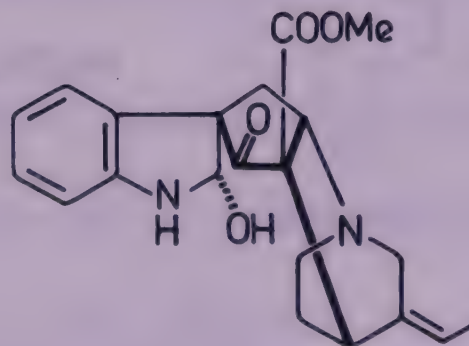
A new alkaloid - rhazicine - isolated from fresh leaves and its structure determined (*Heterocycles* 1984, 22, 2183); another alkaloid - rhazimine - from leaves and its characterisation (*Tetrahedron Lett.* 1984, 25, 3913); tetrahydroalstonine isolated from fruits (*Planta Med.* 1984, 50, 283); isolation of vincadine from legumes (*J. Nat. Prod.* 1985, 48, 153); didemethoxycarbonyltetrahydrosecamine isolated from roots along with condylocarpine (*J. Nat.*

Prod. 1986, 49, 1138); isolation of dihydrocorynantheol and rhazimol from roots and their ^{13}C -NMR (*Planta Med.* 1986, 52, 73); rhazimal and strictamine isolated (*Planta Med.* 1986, 52, 230); an indole alkaloid - rhazimanine - isolated from fruits and its stereostructure established by NOED measurements (*Phytochemistry* 1986, 25, 1731); another indole alkaloid - bhimberine - isolated and its stereostructure elucidated; bhimberine and rhazimanine possess S and R configurations respectively at C-16 (*Heterocycles* 1986, 24, 703); a new alkaloid from roots characterised as 1,2-dehydroaspidospermidine-N-oxide (*Phytochemistry* 1986, 25, 1779); two new glycosides - isorhamnetin-3-(6-rhamnosylgalactosyl)-7-rhamnoside and 3-(2,6-dirhamnosylgalactosyl)-7-rhamnoside - isolated from leaves together with robinin (*Phytochemistry* 1987, 26, 291); an alkaloid - isorhazicine - from leaves; stereochemistry of rhazicine and isorhazicine determined; configuration of ethylidene group was Z in isorhazicine and E in rhazicine (*Heterocycles* 1987, 26, 405); isolation of a new alkaloid - bharhingine - from leaves along with vincanidine and its characterisation (*Planta Med.* 1987, 53, 256); another new alkaloid - stricticine - from leaves and its structure determination (*Tetrahedron Lett.* 1987, 28, 3609); new mavacurine-type alkaloid - strictine - isolated from leaves and its structure determined by ^{13}C -NMR (*Heterocycles* 1987, 26, 2125); another alkaloid - Nb-methylstrictamine - from leaves and its structure elucidation (*Z. Naturforsch.* 1987, 42B, 91; *Chem. Abstr.* 1987, 107, 194873 h); a new dihydroindole alkaloid - aspidospermidose - isolated from leaves and its structure determined (*J. Chem. Soc. Perkin 1*, 1987, 1701); new alkaloids - strictanol and strictanine - from fruits and their characterisation (*Phytochemistry* 1987, 26, 589); two new dimeric indole alkaloids - 16(R) and 16(S)16'-decarbomethoxytetrahydrosecamines - isolated from roots and their structures established (*Phytochemistry* 1988, 27, 1926); isolation of an alkaloid - 15 β -hydroxyvincadifformine - from leaves and its characterisation (*Phytochemistry* 1988, 27, 3721); isolation of stemmadenine from leaves (*J. Nat. Prod.* 1988, 51, 186); a novel alkaloid - rhazizine - isolated from leaves and its stereostructure determined by 2D-NMR (*Tetrahedron* 1989, 45, 3507).

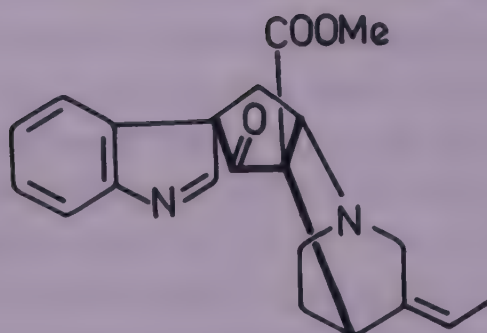
NEW COMPOUNDS



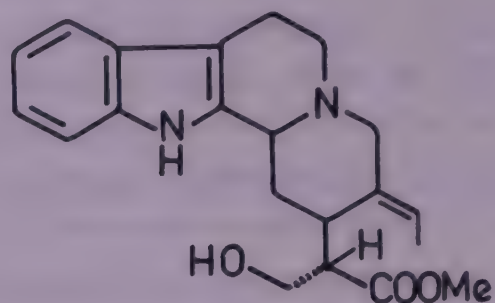
Rhazicine



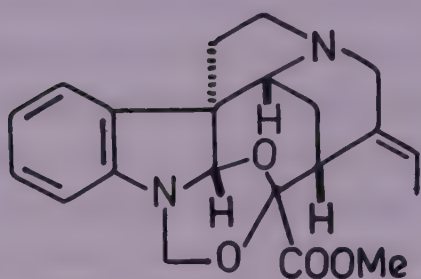
Isorhazicine



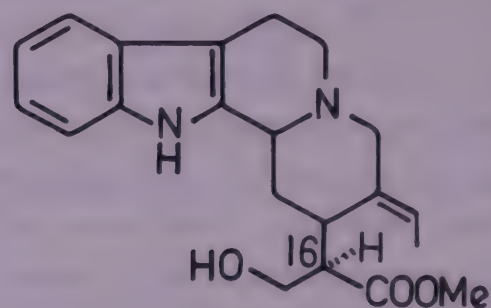
Rhazimine



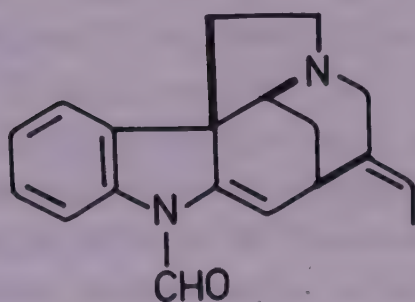
Rhazimanine



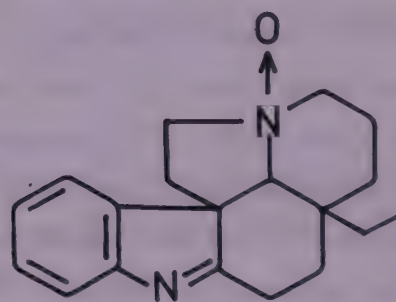
Rhazizine



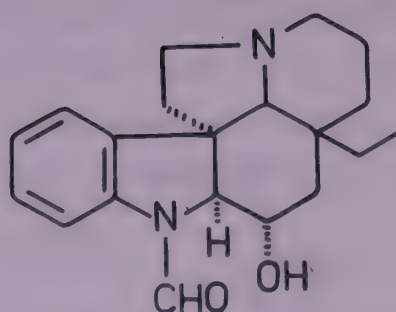
Bhimberine



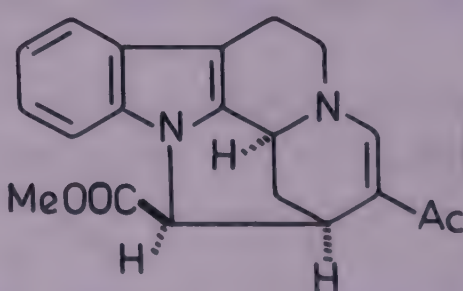
Bharhingine



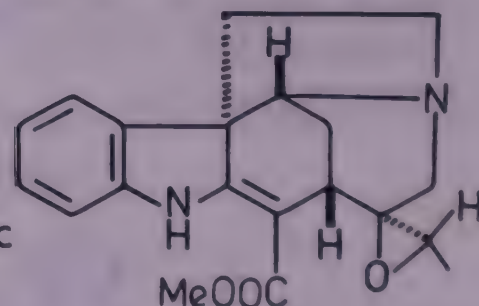
1,2-Dehydroaspidospermidine N-oxide



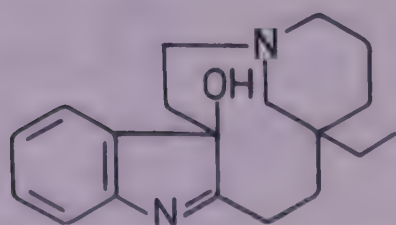
Strictanine



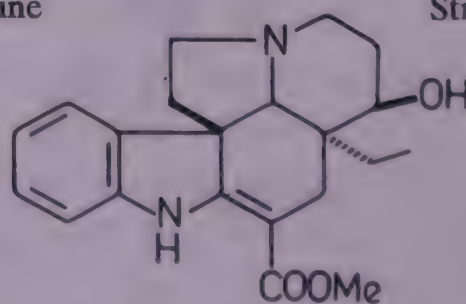
Strictine

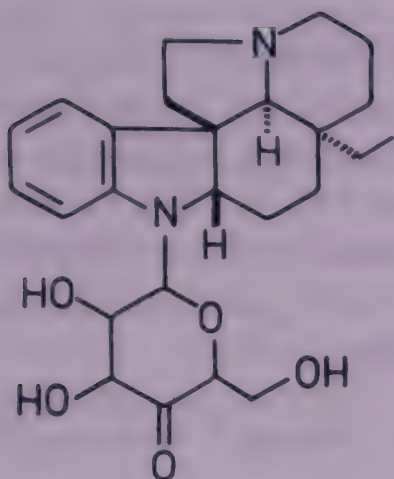


Stricticine

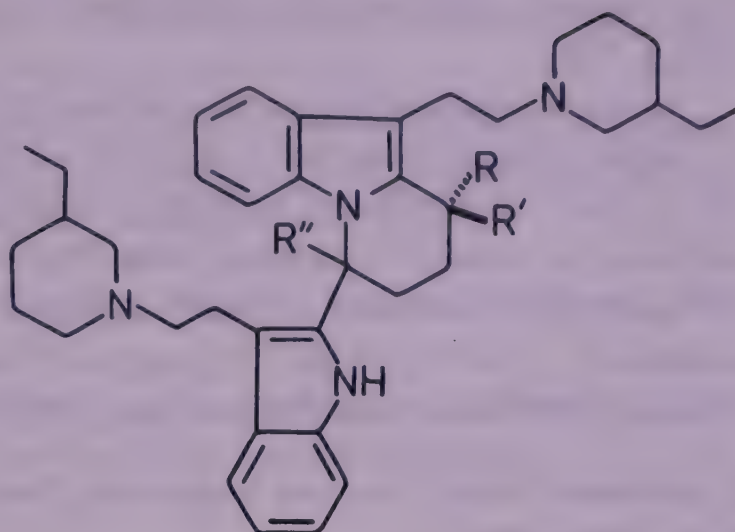


Strictanol

15 β -Hydroxyvincadifformine



Aspidospermidose



16(S)16'-Decarbomethoxytetrahydrosecamine

R,R'' = H, R' = COOMe

16(R)16'-Decarbomethoxytetrahydrosecamine

R = COOMe, R',R'' = H

BIOLOGICAL ACTIVITY

Stemmadenine exhibited antimicrobial activity against *Pseudomonas aeruginosa*, *Escherichia coli*, *Staphylococcus aureus* and *Candida albicans* (*J. Nat. Prod.* 1988, 51, 186).

RHEUM (Polygonaceae)

R. moorcroftianum Royle (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 212).

Pachybasin, chrysophanol, emodin, β -sitosterol and its glucoside identified in rhizomes (*Fitoterapia* 1988, 59, 248); rhizomes afforded physcion, chrysophanol, its 8-O-glucoside and emodin-8-O-glucoside (*Pharmazie* 1989, 44, 509; *Chem. Abstr.* 1989, 111, 150609 e).

BIOLOGICAL ACTIVITY

Chrysophanol and emodin exhibited mild spermicidal activity against human spermatozoa (*Fitoterapia* 1988, 59, 248).

R. officinale Baillon (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 212).

Identification of rhein in roots (*J. Ethnopharmacol.* 1987, 19, 279; *Chem. Abstr.* 1987, 107, 172440 n).

BIOLOGICAL ACTIVITY

Rhein exhibited antibacterial activity against *Bacillus fragilis* (*J. Ethnopharmacol.* 1987, 19, 279; *Chem. Abstr.* 1987, 107, 172440 n).

R. palmatum L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 582).

Total anthraquinone content in decoctions of root and rhizome were 3.9, 4.1, 5.5, 4.6 and 4.1 mg/ml in samples boiled for 5, 10, 15, 20 and 25 min respectively (*Yaoxue Tongbao* 1985, 20, 14; *Chem. Abstr.* 1985, 103, 11309 d); 6'-O-galloyl-, 4'-O-galloyl-, 6-O-galloyl- and 1'-O-galloylsucrose isolated from Chinese plant (*Phytochemistry* 1988, 27, 1469); five new esters - 1-O-galloyl-6-O-cinnamoyl-, 1,2-di-O-galloyl-6-O-cinnamoyl-, 1,2-di-O-galloyl-6-O-p-coumaroyl-, 1,6-di-O-galloyl-2-O-p-coumaroyl- and 1,2-di-O-galloyl- β -D-glucose - also isolated from Chinese plant (*Phytochemistry* 1988, 27, 1473).

R. webbianum Royle (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 550).

Isolation of 1,8-dihydroxy-3-methyl-, 1,8-dihydroxy-3-hydroxymethyl- and 1,6,8-trihydroxy-3-methyl-anthraquinones from roots (*J. Indian Chem. Soc.* 1988, 65, 227).

RHIZOPHORA (Rhizophoraceae)

R. mucronata Lamk. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 212).

Isolation of 25(S)spirost-5-ene-23 β ,14 α -diol (*Fitoterapia* 1988, 59, 79).

RHODIOLA (Crassulaceae)

R. linearifolia (Royle) Fu; see *R. sinuata* (Royle ex Edgew.) Fu

R. sinuata (Royle ex Edgew.) Fu syn. *R. linearifolia* (Royle) Fu (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 583).

Rosiridol, rositidin, β -sitosterol and daucosterol identified in rhizomes (*Khim. Pri. Soedin.* 1986, 643; *Chem. Abstr.* 1987, 106, 64350 d).

RHODODENDRON (Ericaceae)

R. anthopogon D.Don; see *R. anthopogon* D.Don ssp. *hypenanthum* (Balf.f.) Cullen

R. anthopogon D.Don ssp. *hypenanthum* (Balf.f.) Cullen syn. *R. anthopogon* auct. (non D.Don) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 550).

Quercetin-3-O- α -L-rhamnopyranoside, kaempferol, its 4-methyl ether and 3-O-glucoside isolated from leaves (*Indian Drugs* 1986, 24, 116); 24-methylenecycloartenyl acetate, betulinic acid, ursolic acid, its acetate, epifriedelinol, β -sitosterol and rutin isolated (*Indian Drugs* 1987, 2, 273).

R. arboreum Sm. syn. *R. nilagiricum* Zenk., *R. cinnamomeum* Wall. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 584).

Aqueous, ethanolic and methanolic extracts of flowers exhibited significant anti-inflammatory activity against carrageenin, PG(E2), histamine and 5-HT-induced rats hind paw oedema in decreasing order of activity (*Indian J. Pharmacol.* 1988, 20, 86).

R. barbatum Wall. ex G. Don (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 346).

n-Triacontane, hentriacontanol, friedelin, β -amyrin, oleanolic acid, betulonic acid, β -sitosterol, its glucoside and 5,6,7,4'-tetramethoxyflavone isolated from roots (*J. Nat. Prod.* 1987, 50, 309).

R. cinnamomeum Wall.; see *R. arboreum* Sm.

R. nilagiricum Zenk.; see *R. arboreum* Sm.

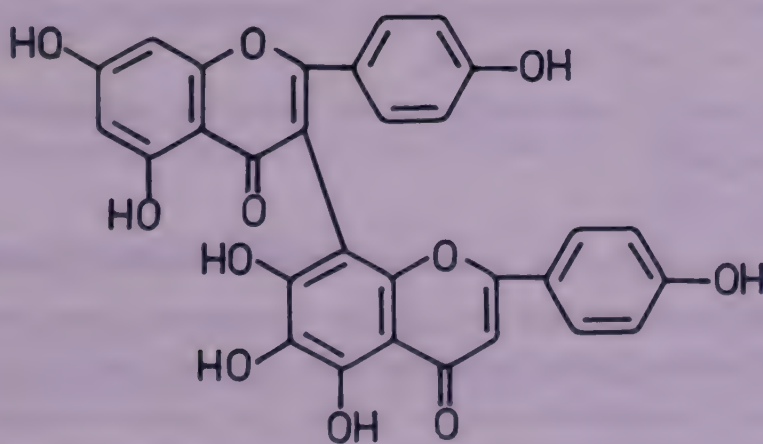
RHUS (Anacardiaceae)

R. chinensis Mill.; see *R. javanicus* L.

R. coriaria L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 585).

A new dimeric flavonoid - sumaf Flavone - isolated from leaves together with agathisflavone, amentoflavone and hinokiflavone and its structure determined (*Chromatographia* 1988, 25, 15; *Chem. Abstr.* 1988, 108, 201685 z).

NEW COMPOUNDS



Sumaflavone

R. cotinus L.; see *Cotinus coggyria* Scop.

R. hookeri Sahni & Bahadur syn. *R. insignis* Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 213).

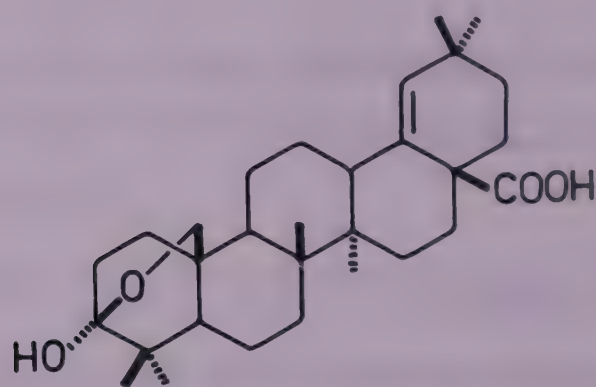
5,7,4'-Trihydroxyflavanone, 3,7,3',4'- and 5,7,3',4'-tetrahydroxyflavanones and 3,5,7,3',4'-pentahydroxyflavanone isolated from leaves (*J. Indian Chem. Soc.* 1985, 62, 487).

R. insignis Hook.f.; see *R. hookeri* Sahni & Bahadur

R. javanicus L. syn. *R. chinensis* Mill., *R. semialata* Murr. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 550).

Isolation and characterisation of semimoronic acid from leaves along with lantabetulic acid (*J. Chem. Res., Synop* 1985, 398; *Chem. Abstr.* 1986, 104, 203824 k); 2-hydroxy-6-pentadecylbenzoic acid and agathisflavone isolated from leaves (*Planta Med.* 1985, 51, 467).

NEW COMPOUNDS



Semimoronic acid

R. mysorensis G.Don (*mysurensis*)

H.-Dahsara; Kan. - Sabale; Mar. - Amboni; Rajasthan - Dasarni, Dasani, Davan; Tam. - Chippamaram, Sappalu; Tel. - Sitha.

Amentoflavone, cupressuflavone, hinokiflavone, 3-O-glucosides and 3-O-rhamnosides of quercetin and kaempferol, myricetin and its 3-O-rhamnoside isolated from leaves (*J. Indian Chem. Soc.* 1984, 61, 649; *ibid.* 1989, 66, 68).

Distribution : Drier parts of north-western India, extending southwards into Deccan Peninsula, in plains.

BIOLOGICAL ACTIVITY

Amentoflavone (50.0 mg/kg, i.p.) exhibited biphasic antiulcerogenic effect in rats against gastric ulcers induced by pylorus ligation 1 hr after treatment; at same dose it also prevented gastric ulcers in rats induced by 8 hr immobilisation stress and duodenal ulcers in guinea pigs induced by histamine. Amentoflavone (25.0 mg/kg, i.p.) when administered 45 min before carrageenin challenge inhibited paw inflammation in rats (*Indian J. Med. Res.* 1987, 85, 689).

Note : Some authors consider *Rhus mysorensis* G.Don to be a synonym of *Rhus sinuata* Thunb.

R. semialata Murr.; see *R. javanicus* L.

R. wallichii Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 214).

Isolation of kaempferol, myricetin, amentoflavone, gallic acid, β -sitosterol, its glucoside, quercetin, its 3-O-arabinoside, 3-O-xyloside and 3-O-galactoside, quercitrin and its 3-O-glucoside from leaves (*J. Indian Chem. Soc.* 1985, 62, 560; *J. Nat. Prod.* 1986, 49, 546).

RHYNCHOSIA (Papilionaceae)

R. albiflora (Sims) Alston; see *R. hirta* (Andrews) Meikle & Verd.

R. aurea DC.; see *R. capitata* DC.

R. beddomei Baker (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 551).

Lucenin-2, apigenin, naringenin, rhynchosin and C-glycosides of vitexin, isovitexin, orientin, isoorientin and vicenin-2 isolated (*Experientia* 1985, 41, 251).

R. cana DC.

Isolation of orientin, isoorientin, vitexin, isovitexin and vicenin-2 from leaves (*J. Nat. Prod.* 1986, 49, 1158).

Distribution : Western peninsular India.

R. capitata DC. syn. *R. aurea* auct. (non DC.) p.p.

C-Glycosides of vitexin, isovitexin, orientin, isoorientin and vicenin-2 identified (*Experientia* 1985, 41, 251).

Distribution : Throughout plains of India.

R. cyanosperma Benth. ex Baker; see *R. hirta* (Andrews) Meikle & Verd.

R. heynei Wt. & Arn.

Isolation of C-glycosides of vitexin, isovitexin, orientin, isoorientin and vicenin-2 (*Experientia* 1985, 41, 251).

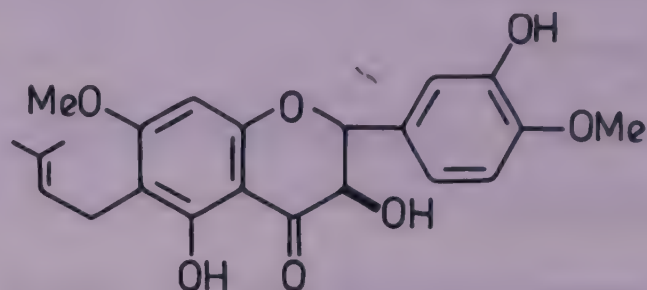
Distribution : Karnataka and in Nilgiris.

R. hirta (Andrews) Meikle & Verd. syn. *R. cyanosperma* Benth. ex Baker, *R. albiflora* (Sims) Alston (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 552).

Isolation of rutin, kaempferol-3-rutinoside, tirumalin and rhynchospermin (*Experientia* 1985, 41, 251); leaves afforded vanillic acid whereas kaempferol-3-rutinoside isolated from stems (*Indian J. Chem.* 1985, 24B, 453); new γ -glutamylpeptides - γ -L-glutamyl- α -methylen- β -aminopropionic acid and ethyl γ -L-glutamyl- β -aminoisobutyrate - isolated from seeds along

with γ -L-glutamyl- β -aminoisobutyric acid; new compounds characterised (*Phytochemistry* 1988, 27, 607); synthesis of isorhynchosperrin (*Indian J. Chem.* 1985, 24B, 880); isolation of a new dihydroflavonol - isotirumalin - from leaves and its structure elucidation (*Indian J. Chem.* 1988, 27B, 383).

NEW COMPOUNDS



Isotirumalin

R. minima (L.) DC. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 587).

Isolation of lucenin-2 along with C-glycosides of vitexin, isovitexin, orientin, isoorientin and vicianin-2 (*Experientia* 1985, 41, 251).

R. rothii Benth. ex Aitch. syn. *R. sericea* Span.

C-Glycosides of vitexin, isovitexin, orientin, isoorientin and vicianin-2 isolated (*Experientia* 1985, 41, 251); isolation of orientin, isoorientin, isovitexin, vicianin-2 and lucenin-2 from leaves (*Acta Cienc. Indica, Chem.* 1987, 13, 187; *Chem. Abstr.* 1989, 111, 36648 s).

Distribution : Western and central Himalayas and hills of western peninsular India, alt. 1500-1800 m.

R. rufescens (Willd.) DC.

Kaempferol, its 3-methyl ether and quercetin-3-methyl ether isolated from leaves (*Pharmazie* 1984, 39, 714; *Chem. Abstr.* 1985, 102, 93018 z); pinitol, orientin, isoorientin, vitexin and isovitexin from stems (*Indian J. Chem.* 1985, 24B, 453); lucenin-2, C-glycosides of vitexin, isovitexin, orientin isoorientin and vicianin-2 isolated (*Experientia* 1985, 41, 251).

Distribution : Western peninsula and Khasia Hills, ascending to 1500 m.

R. sericea Span.; see *R. rothii* Benth. ex Aitch.

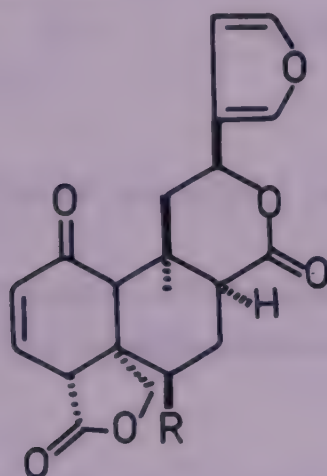
R. suaveolens DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 552).

Isolation of orientin, isoorientin, vitexin, isovitexin, vicianin-2, mangiferin and isomangiferin from leaves and stems whereas luteolin and (+)pinitol isolated only from leaves (*Indian J. Chem.* 1985, 24B, 453; *J. Nat. Prod.* 1985, 48, 156).

RHYNCHOSPERMUM (Asteraceae)

R. verticillatum Reinw. ex Blume (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 214).

Five new ent-clerodane diterpenoids - rhynchosperins A, B, C and isomeric rhynchospermosides A and B - isolated from whole plant and their structures elucidated (*Phytochemistry* 1987, 26, 3289).

NEW COMPOUNDS

Rhynchosperin A

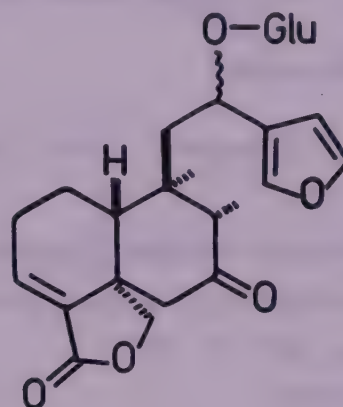
R = H

Rhynchosperin B

R = OH

Rhynchosperin C

R = Tigloyloxy



Rhynchospermoside A

~ = α

Rhynchospermoside B

~ = β **RIBES (Grossulariaceae)**

R. nigrum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 553).

Spathulenol identified in bud oil by GC-MS (*Sci. Aliments* 1986, 6, 47; *Chem. Abstr.* 1986, 104, 230242 a).

RICINUS (Euphorbiaceae)

R. communis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 553).

Gavage administration of castor oil to rats produced large amounts (5-6 fold greater than in control) of platelet-activating factor in duodenum and jejunum but not in ileum and colon. Intraluminal release of acid phosphatase (AP) was also increased (5-6 fold greater than in control) in duodenum and jejunum of such rats (*Brit. J. Pharmacol.* 1989, 96, 872).

Isolation of β -amyrin, stigmasterol, β -sitosterol, ricinine, quercetin, rutin and hyperoside from leaves (*J. Drug. Res.* 1983, 14, 189; *Chem. Abstr.* 1985, 102, 21298 t); leaves afforded ricinine, N-demethylricinine, 3-O- β -D-xylopyranosides, 3-O- β -D-glucopyranosides and 3-O- β -D-rutinosides of kaempferol and quercetin (*J. Nat. Prod.* 1985, 48, 155).

RIVEA (Convolvulaceae)

R. corymbosa Haill. f.; see *Turbina corymbosa* (L.) Rafin.

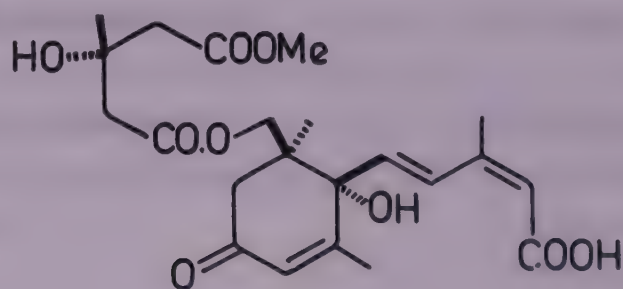
R. cuneata Wight; see *Argyrea cuneata* (Willd.) Ker-Gawl.

ROBINIA (Papilionaceae)

R. pseudoacacia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 553).

A new abscisic acid-conjugated metabolite - MeHMG-HOABA - isolated from immature seeds and characterised; β -hydroxy- β -methyl-glutaryl-hydroxyabscisic acid also isolated (*Agric. Biol. Chem.* 1987, 51, 2351).

NEW COMPOUNDS



MeHMG-HOABA

ROSA (Rosaceae)

R. chinensis Jacq.; see *R. indica* L.

R. cymosa Tratt. syn. *R. microcarpa* Lindl. (non Retz.)

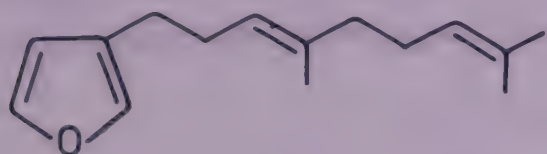
Eugenol (41.64), linalool (9.26), nonadecane (6.73), heptadecane (4.81), geraniol (4.53), 1-heptadecene (3.91), benzyl alcohol (3.55), cinnamaldehyde (3.43), ethyl benzoate (2.88) and trans-linalool oxide (0.98%) determined in flower essential oil (*Yunnan Zhiwu Yanjiu* 1988, 10, 483; *Chem. Abstr.* 1989, 110, 218765 q).

Distribution : Grown in Indian gardens.

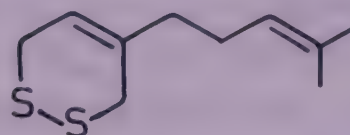
R. damascena Mill. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 554).

Isolation of citronellol, nerol, geraniol, β -phenylethanol, eugenol, methyleugenol, β -sitosterol, pectolinarigenin, kaempferol-3-O-glucoside and kaempferol-3-O-galactoside from roots (*Nauchni Tr.-Plovdivski Univ.* 1984, 22, 221; *Chem. Abstr.* 1986, 105, 94467 u); five fragrant compounds (I-V) identified in Bulgarian rose oil by GC-MS (*Dev. Food Sci.* 1988, 18, 707; *Chem. Abstr.* 1988, 109, 176072 h).

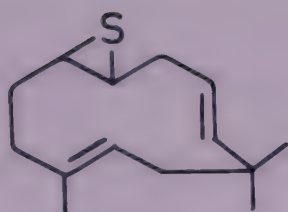
NEW COMPOUNDS



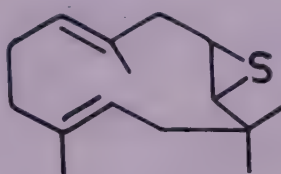
I



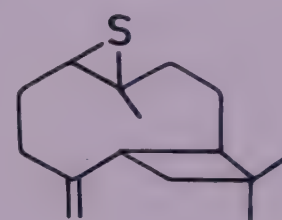
II



III



IV



V

R. eglanteria L.; see *R. foetida* Herrm.

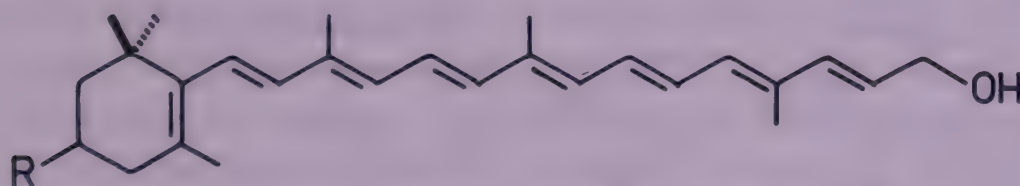
R. foetida Herrm. syn. *R. eglanteria* sensu Hook.f. (non L.)

Eng. - Austrian briar.

Two novel pigments - 10'-apo- β -carotene-10'-ol and galloxanthin [3(R)10'-apo- β -carotene-3,10'-diol] - isolated from petals and characterised (*Helv. Chim. Acta* 1987, 70, 1988).

Distribution : Kashmir, alt. 2400-3300 m.

NEW COMPOUNDS



10'-Apo- β -Carotene-10'-ol

R = H

Galloxanthin

R = OH

R. indica L. syn. *R. chinensis* Jacq. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 589).

Linalool acetate (14.98), limonene (12.07), methoxymethylbenzene (9.88), citronellol (4.82), β -caryophyllene (4.55), hexanol acetate (3.98), linalool (3.18) and hexanol (3.17%)

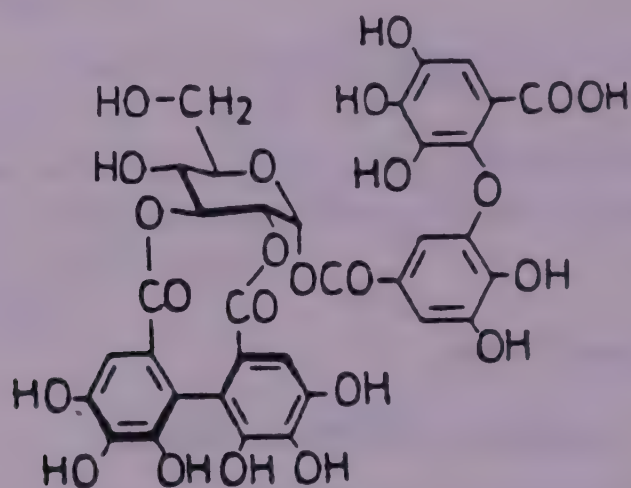
determined in flower essential oil by MS (Zhiwu Xuebao 1987, 29, 297; *Chem. Abstr.* 1987, 107, 161354 m); flower essential oil from plants growing in Pakistan contained alcohols (83.3) comprising rhodinol (36.3), geraniol (24.4), phenylethyl alcohol (12.1) and nerol (7.6%) (*Pakistan J. Sci. Ind. Res.* 1989, 32, 183; *Chem. Abstr.* 1989, 111, 180444 q).

R. laevigata Michx. syn. *R. sinica* sensu Hook.f. (non L., nec Ait.)

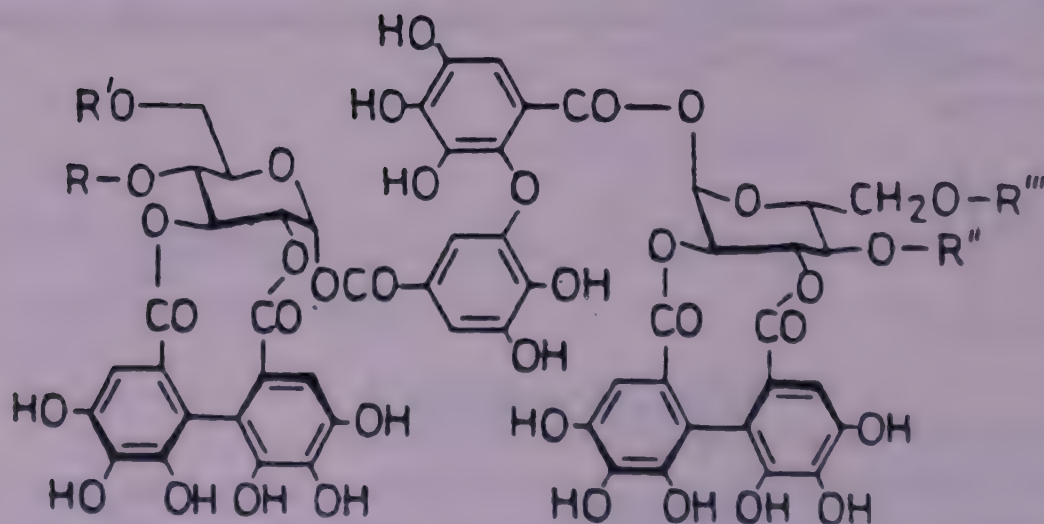
Four new hydrolysable tannins - laevigatins A, B, C and D - isolated from Chinese plant together with agrimonin and agrimonic acids A and B; structures of new tannins established (*Chem. Pharm. Bull.* 1989, 37, 920).

Distribution : Introduced into Indian gardens.

NEW COMPOUNDS



Laevigatin A

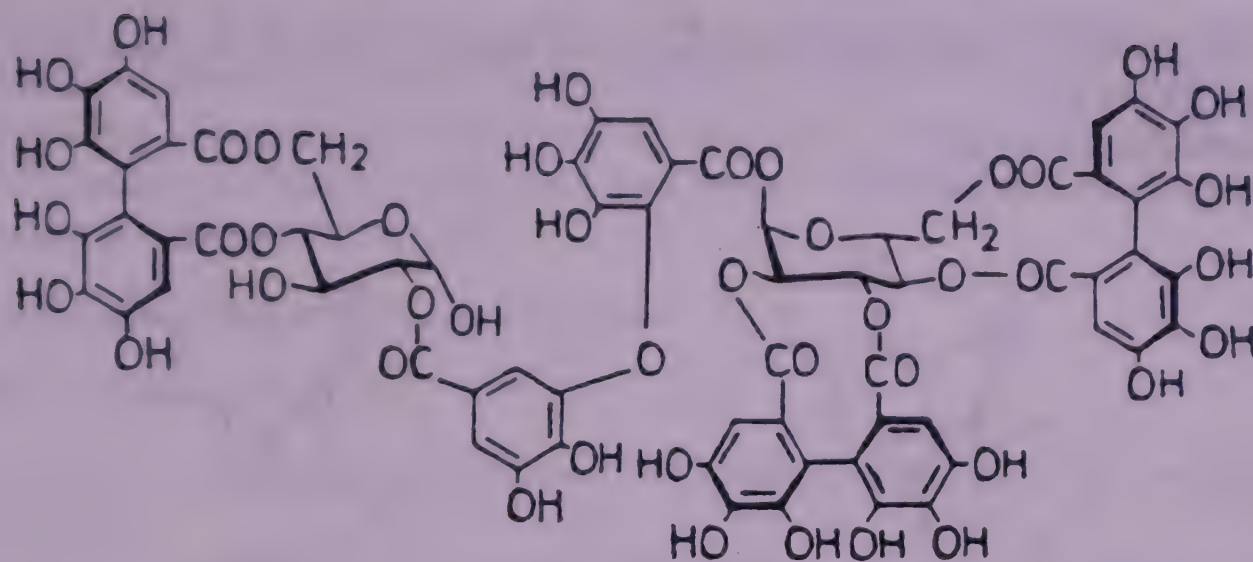


Laevigatin B

$R, R' = H, R'', R''' = (S)\text{Hexahydroxydiphenoyl}$

Laevigatin C

$R, R' = (S)\text{Hexahydroxydiphenoyl}, R'', R''' = H$



Laevigatin D

R. microcarpa Lindl.; see *R. cymosa* Tratt.

R. sinica Ait.; see *R. laevigata* Michx.

ROSMARINUS (Lamiaceae)

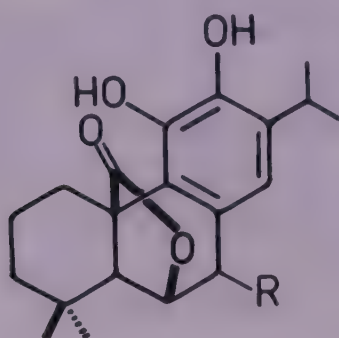
R. officinalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 555).

Rosemary oil inhibited contraction of electrically stimulated guinea pig ileum; at the lowest active dose, (IC₅₀ 0.17 mg/kg), it caused initial increase of contractile response followed by spasmolytic action (*Fitoterapia* 1988, 59, 463).

Oil (1.52 ml/100 g) from Romanian plant contained borneol, bornyl acetate, camphene, camphor, car-3-ene, 1,8-cineole, p-cymene, limonene, linalool, linalyl acetate, ocimene, α - and β -pinenes, α -terpinene and terpineol (*Clujul Med.* 1984, 57, 374; *Chem. Abstr.* 1985, 103, 76069 v); two new antioxidative diterpenes - epirosmanol and isorosmanol - isolated and characterised (*Agric. Biol. Chem.* 1984, 48, 2081); structure of rosmanol revised to 7 α ,11,12-trihydroxy-6,10-(epoxymethano)abieta-8,11,13-trien-20-one by X-ray analysis (*Agric. Biol. Chem.* 1984, 48, 2081; *Phytochemistry* 1985, 24, 1853); another diterpene - rosmariquinone - from leaves and its structure elucidation (*J. Am. Oil Chem. Soc.* 1985, 62, 96; *Chem. Abstr.* 1985, 102, 146116 p); synthesis of rosmariquinone (*J. Org. Chem.* 1985, 50, 4996); 7-methoxyrosmanol isolated and characterised from plant grown in Paraguay; betulin and cirsimaritin also isolated (*J. Nat. Prod.* 1987, 50, 1164); borneol, bornyl acetate, camphene, camphor, β -caryophyllene, 1,8-cineole, octen-3-one, α - and β -pinenes, piperitone, α -terpineol, thujone and verbenone detected by GC-MS in oil of plant from Hungary (*Acta Pharm. Hung.* 1987, 57, 159; *Chem. Abstr.* 1987, 107, 183409 k); pinene (21.8%) determined in oil (*Fitoterapia* 1988, 59, 463); three diterpene quinones - taxodione (0.014), horminone (0.009) and cryptotanshi-

none (0.018%) - isolated from roots (*Alexandria J. Pharm. Sci.* 1989, 3, 54; *Chem. Abstr.* 1989, 111, 150574 q).

NEW COMPOUNDS

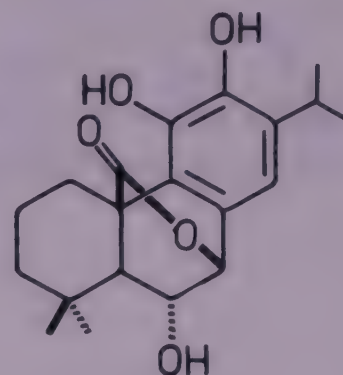


Rosmanol

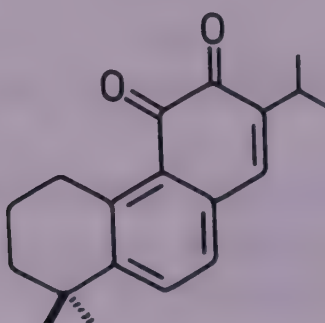
R = α -OH

Epirosmanol

R = β -OH



Isorosmanol



Rosmariquinone

BIOLOGICAL ACTIVITY

Rosmarinic acid diminished inflammatory response induced by infusion of zymosan-activated plasma in rabbits, granulocytopenia and infiltration of polymorphonuclear granulocytes in multiple organs and increase in organ weights decreased. It completely prevented development of pulmonary oedema and multiple organ inflammation in this syndrome (*Agents Actions* 1985, 17, 373; *Chem. Abstr.* 1986, 104, 141904 a); pinene exhibited weak spasmogenic action and increased basal tone of guinea pig ileum (*Fitoterapia* 1988, 59, 463).

ROTHIA (Papilionaceae)

R. indica (L.) Druce syn. *R. trifoliata* (Roth) Pers. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 590).

Isolation of soyasaponin I (*J. Nat. Prod.* 1985, 48, 135); pseudobaptigenin, its 7-O-glucoside (rothindin), β -sitosterol and lupanine isolated; ¹³C-NMR of rothindin studied

(*Fitoterapia* 1985, 56, 287; *Indian Drugs* 1986, 23, 581); in addition hentriacontanol, α -amyrin acetate, lupeol acetate and p-coumaric acid isolated from aerial parts (*Indian Drugs* 1986, 23, 581); isolation of lupanine, its 13α -hydroxy, 13α -angeloyloxy, 13α -tigloyloxy and 13α -(2-methylbutyryl)oxy derivatives, α -isolupanine, α -isosparteine, nuttalline, ammodendrine and cinevanine (*J. Nat. Prod.* 1985, 51, 809).

R. trifoliata (Roth) Pers.; see *R. indica* (L.) Druce

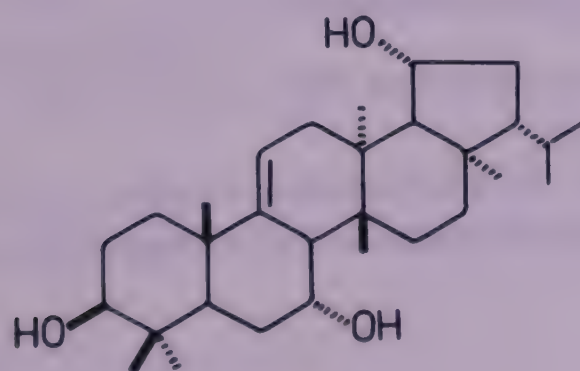
RUBIA (Rubiaceae)

R. cordifolia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 566).

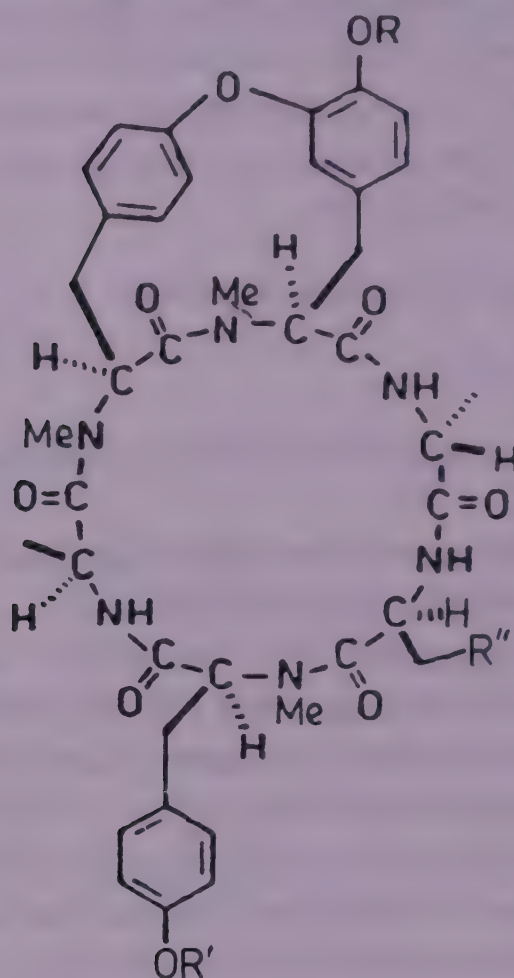
Methanol and chloroform extracts exhibited significant anticancer activity against P-388 lymphocytic leukaemia (*Indian J. Exp. Biol.* 1980, 18, 102).

Antitumor cyclic hexapeptides - RA-V and RA-VII - isolated from roots (*Planta Med.* 1984, 50, 313; *Gann* 1984, 75, 929; *Chem. Abstr.* 1985, 102, 89668 u); hexapeptides - RA-I, RA-II, RA-III and RA-IV isolated as minor constituents; structure of RA-III revised (*Chem. Pharm. Bull.* 1986, 34, 3762); isolation of 1-acetoxy-6-hydroxy-2-methylanthraquinone-3-O- α -rhamnosyl (1 \rightarrow 4)- α -glucoside from roots and its structure elucidation (*Indian J. Chem.* 1985, 24B, 791); three new anthraquinones - 1,4-dihydroxy-2-carbomethoxyanthraquinone, 1-hydroxy-2-carboxy-3-methoxyanthraquinone and 1-hydroxy-2-methyl-6- or 7-methoxyanthraquinone - from roots; β -sitosterol, scopoletol and oleanolic acid acetate also isolated (*Ann. Pharm. Fr.* 1986, 44, 117; *Chem. Abstr.* 1986, 105, 168923 p); more new anthraquinones - 1,3-dihydroxy-2-methoxymethylanthraquinone, 1-methoxy-2-methoxymethyl-3-hydroxyanthraquinone, 4-hydroxy-2-carboxyanthraquinone, 1,4-dihydroxy-2-hydroxymethylanthraquinone and 1-hydroxy-2-hydroxymethylanthraquinone - isolated from roots (*Ann. Pharm. Fr.* 1987, 45, 261; *Chem. Abstr.* 1988, 108, 109550 d); isolation of a new fernane derivative - rubiatriol - from roots and rhizomes and its structure elucidation; alizarin and 2-methyl-1,3,6-trihydroxyanthraquinone also isolated (*J. Nat. Prod.* 1986, 49, 1114).

NEW COMPOUNDS



Rubiatriol



RA-I

R = H, R' = Me, R'' = OH

RA-II

R = Me, R', R'' = H

RA-III

R, R' = Me, R'' = OH

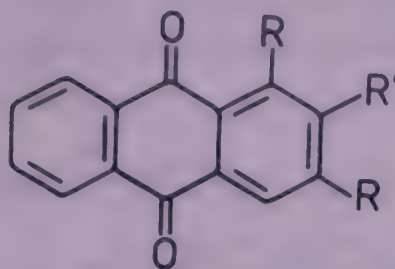
BIOLOGICAL ACTIVITY

RA-V and its N-hexyl ether showed significant activity against human nasopharynx carcinoma (KB), P-388 lymphocytic leukaemia and MM2 mammary carcinoma cells (*Gann* 1984, 75, 929; *Chem. Abstr.* 1985, 102, 89668 u).

R. tinctorum L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 592).

New anthraquinones - nordamnalanthoic acid methyl ester, nordamnalanthal and tectoquinone - isolated from roots and characterised (*Shoyakugaku Zasshi* 1988, 42, 166; *Chem. Abstr.* 1989, 110, 121181 h).

NEW COMPOUNDS



Nordamnalanthal

R = OH, R' = CHO

Tectoquinone

R = H, R' = Me

Nordamnalanthoic acid methyl ester

R = OH, R' = COOMe

BIOLOGICAL ACTIVITY

Lucidin and its ethyl ether caused mutagenesis in five *Salmonella typhimurium* strains and metabolic activation; mutagenicity increased after addition of rat liver S9 mixture (*Cell. Biol. Toxicol.* 1988, 4, 225; *Chem. Abstr.* 1988, 109, 122297 s).

RUBUS (Rosaceae)

R. ellipticus Smith

Assam - Jotelupoka; H. - Hinsalu, Hasalu, Lal anchhu, Lal hasalu; Kash. - Gouriphal; Nep. - Tolu, Aselu; P. - Akhi.

Octacosanol, β -sitosterol, its glucoside, octacosanoic, ursolic and rubitic acids isolated from roots (*Indian Drugs* 1987, 24, 272).

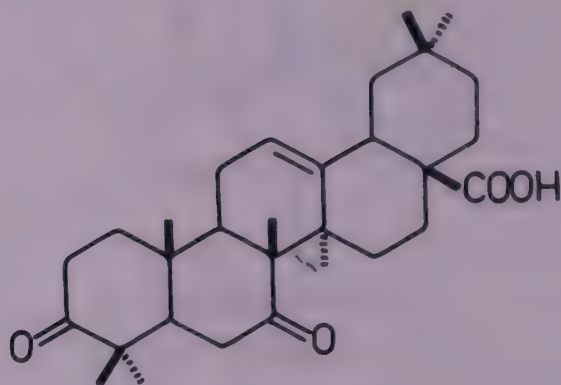
Distribution : Throughout Himalayas and hilly regions of India, alt. 1200-2400 m.

R. fruticosus L.; see *R. ulmifolius* Schott

R. moluccanus L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 593).

A new pentacyclic triterpene - rubonic acid - isolated from whole plant and its structure determined (*Indian J. Chem.* 1987, 26B, 896).

NEW COMPOUNDS

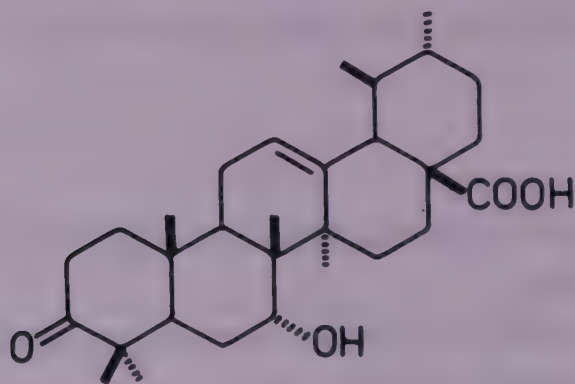


Rubonic acid

R. ulmifolius Schott syn. *R. fruticosus* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 558).

New triterpene acid - rubinic acid - isolated from leaves and its structure elucidated (*Phytochemistry* 1984, 23, 2581).

NEW COMPOUNDS



Rubicinic acid

RUELLIA (Acanthaceae)

R. tuberosa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 558).

Plant contained leucine, tyrosine, valine and glycine (*Acta Cienc. Indica, Chem.* 1984, 10, 10; *Chem. Abstr.* 1985, 103, 102043 d); nonacosane, hentriacontane, lupeol, sitosterol, stigmasterol and campesterol isolated from tubers (*Indian Drugs* 1985, 23, 48).

RUMEX (Polygonaceae)

R. acetosa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 559).

Chrysophanol, its 8-O- β -D-glucoside, physcion, its 1-O- β -D-glucoside and 8-O- β -D-glucoside, emodin and its 8-O- β -D-glucoside isolated from roots (*Shoyakugaku Zasshi* 1987, 41, 67; *Chem. Abstr.* 1987, 107, 151238 n).

R. nepalensis Spreng. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 595).

Aerial parts afforded 1,8-dihydroxy-3-methylanthraquinone, 1,6,8-trihydroxy-3-methylanthraquinone, 1,8-dihydroxy-6-methoxy-3-methylanthraquinone, lupeol and β -sitosterol (*Indian Drugs* 1987, 24, 328).

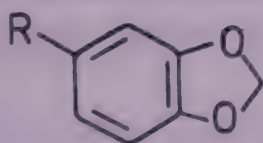
RUTA (Rutaceae)

R. angustifolia Pers.; see *R. chalepensis* L.

R. chalepensis L. syn. *R. graveolens* L. var. *angustifolia* (Pers.) Hook.f., *R. angustifolia* Pers. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 560).

A new alkaloid - 3'-hydroxygraveoline - isolated and characterised along with arborinine, γ -fagarine, rutamarin, bergapten, xanthotoxin and isopimpinellin (*Phytochemistry* 1986, 25, 2692); in addition, skimmianine, kokusaginine, graveoline, chalepin and chalepentin isolated (*Phytochemistry* 1986, 25, 2692; *ibid.* 1988, 27, 650); four shikimate metabolites - moskachans A, B, C and D - isolated from aerial parts and their structures elucidated (*Phytochemistry* 1986, 25, 2209; *An. Quim.* 1987, 83, 15; *Chem. Abstr.* 1987, 107, 112694 p); in addition, psoralen, bergapten, xanthotoxin, benahorin, isoimperatorin, imperatorin, heraclenol, angustifolin, 7-demethylrutacultin, escoparone, 6,7,8-trimethoxycoumarin, methyl nonyl ketone, β -sitosterol, its glucoside and graveoline identified (*An. Quim.* 1987, 83, 15; *Chem. Abstr.* 1987, 107, 112694 p); chalepin and rutamarin synthesised (*Heterocycles* 1987, 26, 1541); isolation of new alkaloid - chaloridone - and a new coumarin - rutalpinin - from roots and determination of their structures (*Phytochemistry* 1988, 27, 650).

NEW COMPOUNDS



Moskachan A

R = Ac

Moskachan B

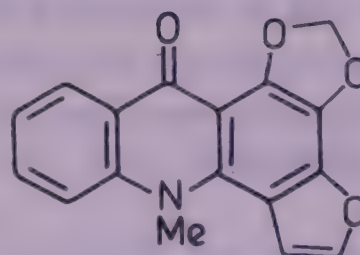
R = (CH₂)₄Ac

Moskachan C

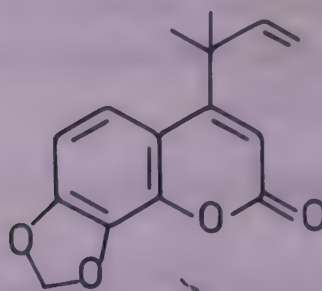
R = (CH₂)₄CH(OH)Me

Moskachan D

R = (CH₂)₆Ac



Chaloridone



Rutalpinin

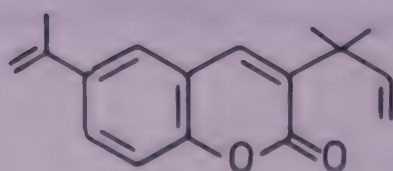
BIOLOGICAL ACTIVITY

Coumarin gradually reduced canine obstructive lymphoedema by 20.0-30.0% over 8 mo, it reduced excess water in oedematous limbs. As a secondary event, fibrosis in skin is also reduced, presumably by an increase in collagenase activity of mononuclear phagocytes (*Clin. Sci.* 1989, 77, 69; *Chem. Abstr.* 1989, 111, 50121 w).

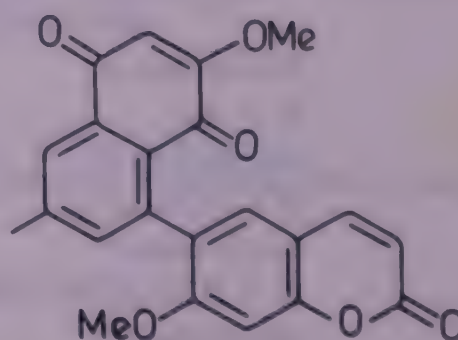
R. graveolens L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 561).

2-Nonanone, 2-nonyl acetate and 2-undecyl acetate identified as main component in leaf oil and 2-undecanone and 2-nonanone in flower and fruit oil (*Z. Lebensm.-Unters. Forsch.* 1985, 181, 28; *Chem. Abstr.* 1985, 103, 128790 v); linalool, camphor, 2-undecanone (49.2), 2-nonanone (24.7), 2-nonyl acetate (6.2%), pregeijerene (2.1), 2-nonanol (0.9), 2-undecanol (0.8) and geijerene (0.7%) and determined by GC-MS in oil from Egyptian plant (*Sci. Pharm.* 1988, 56, 121; *Chem. Abstr.* 1988, 109, 155943 c); a new compound - exodehydrochalepin - isolated from roots and characterised by HPLC and its synthesis (*Sci. Pharm.* 1988, 56, 171; *Chem. Abstr.* 1989, 11, 36749 e); 1-hydroxy-N-methylacridone, 1-hydroxy-3-methoxy-N-methyl-acridone, rutacridone, its epoxide, gravacridone chlorine, hallacridone, dictamnine, campesterol and sitosterol isolated from callus cultures whereas γ -fagarine, skimmianine, bergapten, isopimpinellin along with rutacridone and its epoxide, gravacridone chlorine, hallacridone, dictamnine, campesterol and sitosterol isolated from suspension cultures (*Fitoterapia* 1988, 59, 83); isolation of a new coumarin naphthoquinone derivative - naphthoherniarin - and its structure elucidation (*Planta Med.* 1980, 39, 219; *ibid.* 1989, 55, 68); synthesis of naphthoherniarin (*Ann. Chem.* 1988, 543).

NEW COMPOUNDS



Exodehydrochalepin



Naphthoherniarin

R. graveolens L. var. *angustifolia* (Pers.) Hook.f.; see *R. chalepensis* L.

SACCHARUM (Poaceae)

S. officinarum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 562).

A non-sucrose portion of juice from stalks markedly reduced blood sugar level in mice (*Planta Med.* 1985, 51, 258).

Six glycans - saccharans A, B, C, D, E and F - isolated from hypoglycaemic fraction of stalk juice (*Planta Med.* 1985, 51, 258); neocarlinoside, neoisoschaftoside, orientin, swertia-japonin, vicianin-2 and p-coumaric, ferulic, caffeic and 3,4-di-O-methylcaffeic acids isolated (*Rev. Latinoam. Quim.* 1985, 16, 63; *Chem. Abstr.* 1986, 104, 126514 e).

BIOLOGICAL ACTIVITY

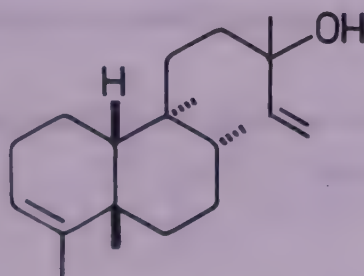
Saccharans A, B, C, D, E and F exhibited remarkable hypoglycaemic activity in normal and alloxan-produced hyperglycaemic mice (*Planta Med.* 1985, 51, 258).

SAGITTARIA (Alismataceae)

S. sagittifolia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 563).

Isolation of a new diterpene - 18-deoxysagittariol - and its structure determination (*Indian J. Chem.* 1986, 25B, 748).

NEW COMPOUNDS



18-Deoxysagittariol

SALIX (Salicaceae)

S. acutifolia Willd. syn. *S. daphnoides* Auct. (non Vill.) (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 357).

Isolation of apigenin, cinaroside, cosmosiin, isoquercetin, luteolin, quercetin, quercimeritrin and rutin from leaves (*Khim. Prir. Soedin.* 1985, 567; *Chem. Abstr.* 1986, 104, 85446 p).

S. alba L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 565).

Amentoflavone, cupressuflavone and apigenin isolated from leaves (*J. Indian Chem. Soc.* 1985, 62, 713).

S. babylonica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 565).

A new benzyl ester of gentisic acid-2'-O-acetyl- β -D-glucoside isolated from leaves along with apigenin-7-O-galactoside, kaempferol-7-O-glucoside, luteolin-4'-O-glucoside, trichocarpin, salicin and an ester of terephthalic acid (*Phytochemistry* 1988, 27, 3010).

S. caprea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 565).

Aromadendrin, (+)catechin, dihydrokaempferide, naringenin, prunin and taxifolin isolated from wood (*J. Nat. Prod.* 1985, 48, 559).

BIOLOGICAL ACTIVITY

Naringenin inhibited growth of *Coniphora puteana*, *Sporotrichum pulverulentum* and *Trichoderma viride*; dihydrokaempferide and aromadendrine inhibited *C. puteana* only, taxifolin and (+)catechin exhibited activity against *T. viride* whereas prunin was active only against *S. pulverulentum* (*J. Nat. Prod.* 1985, 48, 559).

S. daphnoides Vill.;- see *S. acutifolia* Willd.

S. fragilis L.

Eng. - Crack willow, Red wood willow, Kashmir willow; Himachal Pradesh - Tilchang.

Amentoflavone, apigenin and cupressuflavone isolated from leaves (*J. Indian Chem. Soc.* 1985, 62, 713).

Distribution : Planted in Kashmir and Himachal Pradesh, alt. 1300-3300 m and in plains of Punjab and Haryana.

SALMALIA (Bombacaceae)

S. malabarica (DC.) Schott & Endl.; see *Bombax ceiba* L.

SALSOLA (Chenopodiaceae)

S. baryosma (Roem. & Schult.) Dandy syn. *S. foetida* Delile ex Boiss. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 219).

Stigmasterol (36.9), β -sitosterol (29.9), 24-ethylcholest-5,24-dien-3 β -ol (15.7), brassicasterol (12.3) and campesterol (5.2%) determined (*J. Indian Chem. Soc.* 1984, 61, 729).

S. collina C.A. Mey.

Campesterol, cholesterol, β -sitosterol and stigmasterol isolated (*Khim. Prir. Soedin.* 1984, 531; *Chem. Abstr.* 1985, 102, 3263 y).

Distribution : Ladakh, alt. 3300 m.

S. foetida Delile ex Boiss.; see *S. baryosma* (Roem. & Schult.) Dandy

S. kali L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 565).

Isorhamnetin-3-O-glucoside and -3-O-rutinoside isolated from aerial parts (*Fitoterapia* 1985, 56, 365).

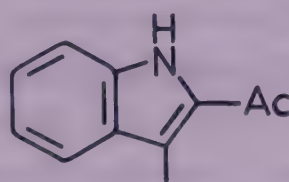
SALVADORA (Salvadoraceae)

S. indica Wight; see *S. persica* L. var. *wightiana* (Planch. ex Thw.) Verdc.

S. persica L.; see *S. persica* L. var. *wightiana* (Planch. ex Thw.) Verdc.

S. persica L. var. *wightiana* (Planch. ex Thw.) Verdc. syn. *S. indica* Wight, *S. persica* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 566).

Isolation of β -sitosterol, its 3-O- β -D-glucoside, octacosanol and 1-triacontanol from stems (*Acta Cienc. Indica, Chem.* 1984, 10, 127; *Chem. Abstr.* 1985, 103, 102041 b); an indole alkaloid - salvadoricine - isolated from leaves and its structure established (*Tetrahedron Lett.* 1987, 28, 163).

NEW COMPOUNDS

Salvadoricine

SALVIA (Lamiaceae)

S. coccinea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 566).

Pelargonidin-3-caffeoylglucosido-5-dimalonylglucoside and pelargonidin-3-p-coumaroylglucosido-5-dimalonylglucoside isolated from flowers (*Phytochemistry* 1987, 26, 2759).

S. farinacea Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 566).

α -Amyrin, betulinic acid, hispidulin, quercetin-3-O-glucoside and 3-O-diglucoside, β -sitosterol and ursolic acid isolated (*Bull. Fac. Sci., Assiut Univ.* 1987, 16, 167; *Chem. Abstr.* 1988, 109, 107763 x).

S. horminum L.

H. - Salbia.

β -Sitosterol (0.08) and ursolic acid (0.06%) determined in aerial parts (*Pharm. Delt., Epistem. Ekdosis* 1985, 11, 39; *Chem. Abstr.* 1986, 104, 126550 p); caffeic and chlorogenic acids, 7-O-glucosides and 7-O-rutinosides of luteolin and apigenin isolated (*Pharm. Acta Helv.* 1988, 63, 90; *Chem. Abstr.* 1988, 109, 167267 y).

Distribution : Grown in gardens in India.

S. lanata Roxb.; see *S. mukerjeea* Bennet & Raizada

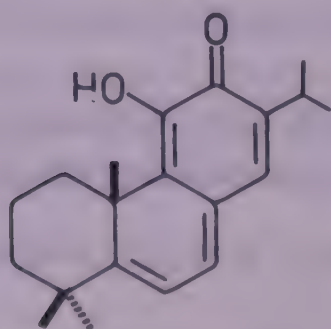
S. leucantha Cav. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 604).

Isolation of 3-epiuvaol (*J. Indian Chem. Soc.* 1988, 65, 458).

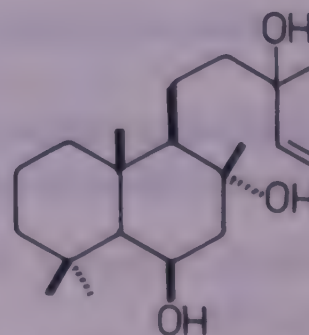
S. moorcroftiana Wall. ex Benth. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 219).

Isolation of 6,7-dehydroroleanone from roots (*Planta Med.* 1984, 50, 355); a new diterpene methylquinone - 15-deoxyfuerstione - isolated from roots and characterised; 7 α -acetoxyrooleanone and toxodione also isolated (*Phytochemistry* 1986, 25, 755); isolation of a new phenalenone derivative (I) from roots and its characterisation as 9-isopropyl-2,2,5-trimethyl-8H-phenaleno[1,9-bc]-furan-8-one; an uncharacterised phenolic diterpenoid also isolated (*Planta Med.* 1986, 52, 408); new diterpenoid - 6 β -hydroxysclareol - from aerial parts along with sclareol, β -sitosterol and salvigenin; structure of new compound elucidated (*An. Quim.* 1986, 82C, 257; *Chem. Abstr.* 1987, 106, 211015 d); a new abietane epoxide - 5 α -hydroxyabieta-8,11,13-triene-7-one-1,10-epoxide (II) - isolated from roots and characterised; royleanone and its 7 α -hydroxy, 7 β -hydroxy, 7 α -acetoxy and 7-oxo derivatives also isolated (*Proc. Indian Acad. Sci., Chem. Sci.* 1986, 97, 167).

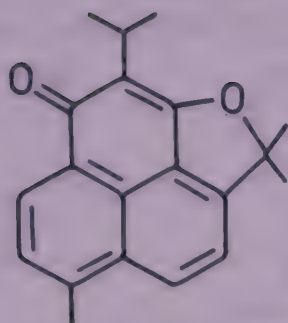
NEW COMPOUNDS



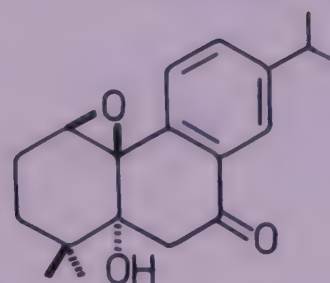
15-Deoxyfuerstione



6 β -Hydroxysclareol



I



II

S. mukerjeea Bennet & Raizada syn. *S. lanata* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 567).

Identification of α -amyrin, uvaol and ursolic acid (*J. Indian Chem. Soc.* 1985, 62, 77); horminone, royleanone and its 7-acetoxy derivative isolated from roots (*Indian J. Chem.* 1985, 24B, 1190); o-hydroxy-p-benzoquinone, 6-dehydroroyleanone and sugiol isolated (*J. Indian Chem. Soc.* 1987, 64, 129).

S. officinalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 567).

Sage oil inhibited contraction of electrically-stimulated guinea pig ileum; at the lowest active dose spasmogen-spasmolytic action occasionally seen (*Fitoterapia* 1988, 59, 463).

Thujone (37.10), cineole (16.51) and camphor (15.53%) determined in oil by GLC (*Bul. Shkencave Nat.* 1985, 39, 65; *Chem. Abstr.* 1986, 104, 145538 g); camphor and α -thujone identified in oil from Turkish plant (*Phytochemistry* 1987, 26, 846); pinene (8.4%) determined in oil (*Fitoterapia* 1988, 59, 463).

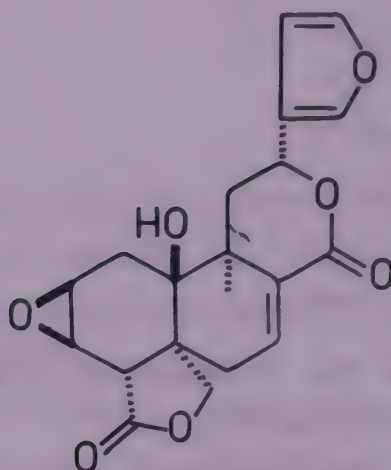
BIOLOGICAL ACTIVITY

Pinene exhibited spasmolytic activity in electrically stimulated guinea pig ileum (*Fitoterapia* 1988, 59, 463).

S. plebeia R.Br. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 605).

Eupafolin, eupatorin, hispidulin and homoplantagin isolated (*Shoyakugaku Zasshi* 1984, 38, 201; *Chem. Abstr.* 1985, 102, 56094 a); a new neoclerodane diterpene - epoxysalviacoccin - isolated from aerial parts along with salviacoccin and characterised (*Phytochemistry* 1986, 25, 272); identification of hispidulin, nepetin, neopitrin, 4-hydroxyphenyllactic acid, caffeic acid and homoplantagin (*Yiyao Gongye* 1987, 18, 349; *Chem. Abstr.* 1987, 107, 233142 r).

NEW COMPOUNDS



Epoxysalviacoccin

BIOLOGICAL ACTIVITY

Eupafolin, hispidulin and homoplantaginin exhibited antihepatotoxic activity (*Shoyakugaku Zasshi* 1984, 38, 201; *Chem. Abstr.* 1985, 102, 56094 a); caffeic acid inhibited *Herpes simplex* virus type 1 (Yiyao Gongye 1987, 18, 349; *Chem. Abstr.* 1987, 107, 233142 r).

S. splendens Ker-Gawl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 568).

Isolation of pelargonidin-3-caffeoylglucosido-5-dimalonylglucoside and pelargonidin-3-p-coumaroylglucosido-5-dimalonylglucoside from flowers (*Phytochemistry* 1987, 26, 2759).

SANSEVIERIA (Agavaceae)

S. cylindrica Bojer

H. - Sanseveria.

Isolation of β -sitosterol from unsaponifiable fraction of lipids from leaves whereas unsaponifiable fraction of roots afforded β -carotene (*Bull. Pharm. Sci., Assiut Univ.* 1986, 9, 1; *Chem. Abstr.* 1987, 107, 172431 k).

Distribution : Introduced into India and grown in gardens.

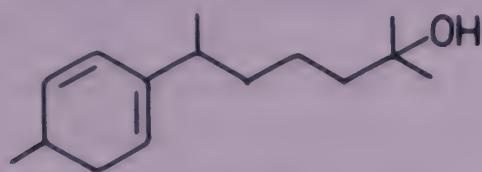
SANTALUM (Santalaceae)

S. album (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 569).

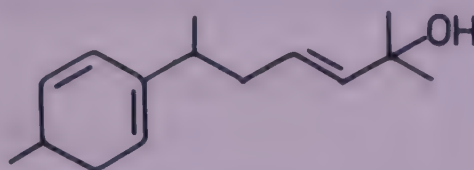
A new ketosantallic acid isolated as its methyl ester from oil and characterised as 11-keto-dihydro- α -santallic acid (*Indian J. Chem.* 1986, 25B, 1006); five new sesquiterpene bisabolanes - bisabolenols A, B, C, D and E - isolated from Chinese sandal wood oil and their structures elucidated; tricycloekasantolol, α - and β -santalenes, α - and β -santalols, α - and

β -santalals, trans- α -bergamotene, α -curcumone and nuciferol also isolated (*Yaoxue Xuebao* 1988, 23, 868; *Chem. Abstr.* 1989, 110, 236993 s).

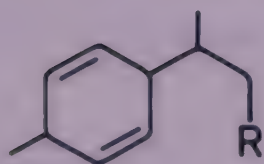
NEW COMPOUNDS



Bisabolenol A



Bisabolenol B



Bisabolenol C

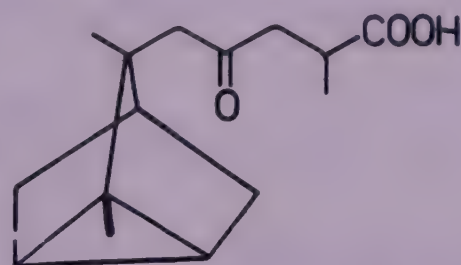
R = CH=CHC(OH)Me₂

Bisabolenol D

R = CH₂CH(OH)CHMe₂

Bisabolenol E

R = CH(OH)CH=CMe₂



11-Keto-dihydro- α -santalallic acid

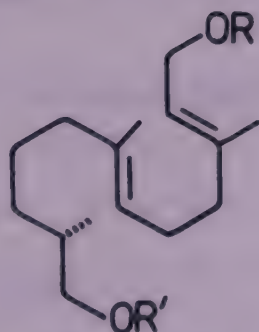
SAPINDUS (Sapindaceae)

S. laurifolia Vahl; see *S. trifoliatus* L.

S. mukurossi Gaertn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 570).

New acyclic sesquiterpene oligoglycosides - mukuroziosides Ia, Ib, IIa and IIb - isolated from pericarp and their structures determined (*Phytochemistry* 1986, 25, 871).

NEW COMPOUNDS

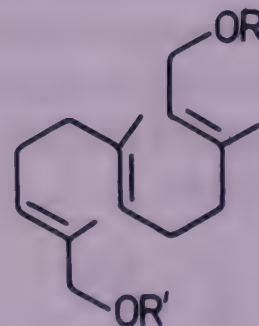


Mukurozioside Ia

R = X, R' = Y

Mukurozioside IIa

R, R' = X



Mukurozioside Ib

R = X, R' = Y

Mukurozioside IIb

R, R' = X

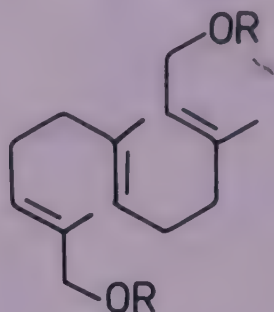
X = Glu[(2→1)Rha](3→1)Rha

Y = Glu(2→1)Rha

S. trifoliatum L. syn. *S. trifoliatum* sensu Hook.f., p.p., *S. laurifolia* Vahl (*laurifolius*) (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 360).

New acyclic sesquiterpene oligoglycoside - trifolioside II - isolated from pericarp and partially characterised; saponins A and B also isolated (*Phytochemistry* 1988, 27, 2209).

NEW COMPOUNDS



Trifolioside II

R = Glu[(2→1)Rha](3→1)Xyl

BIOLOGICAL ACTIVITY

Saponin from plant found useful as an adjuvant for a vaccine against foot-and-mouth disease virus in guinea pigs (*Indian Vet. J.* 1983, 64, 813; *Chem. Abstr.* 1988, 108, 48911 y).

S. trifoliatum Hook.f.; see *S. trifoliatum* L.

SAPIUM (Euphorbiaceae)

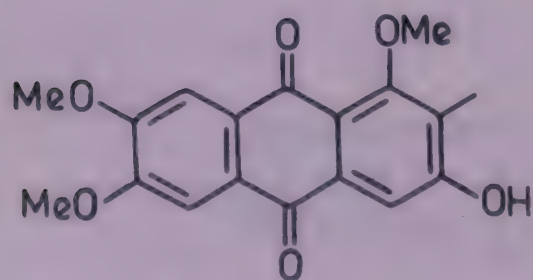
S. eugniifolium Hook.f.

Assam - Korha; Khasi - Dieng-soh-mrit, Umtapoh; Nep. - Pipalpate, Phirphire.

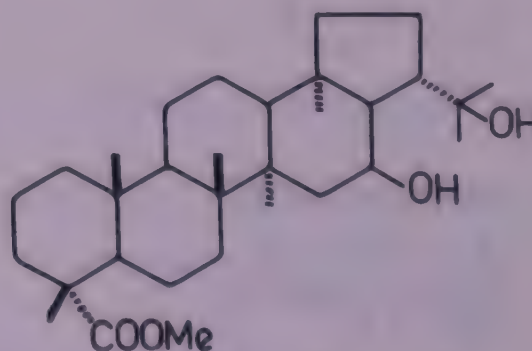
A new triterpenic ester - methyl 16,22-dihydroxyhopan-23-oate - isolated from stem bark along with β -sitosterol and moretenone and characterised (*Curr. Sci.* 1987, 56, 147); isolation of a new triterpene acid and its characterisation as urs-3-O-acetyl-20(30)-en-28-oic acid; moretenone also isolated (*Curr. Sci.* 1988, 57, 824); a new anthraquinone - eugnone - from stem bark and its structure elucidation (*Curr. Sci.* 1988, 57, 796).

Distribution : Himalayas from Kumaon to Sikkim and Meghalaya, Assam and Manipur, ascending to 1200 m.

NEW COMPOUNDS



Eugnone



Methyl 16,22-dihydroxyhopan-23-oate

S. indicum Willd.; see *Excoecaria indica* (Willd.) Muell.-Arg.

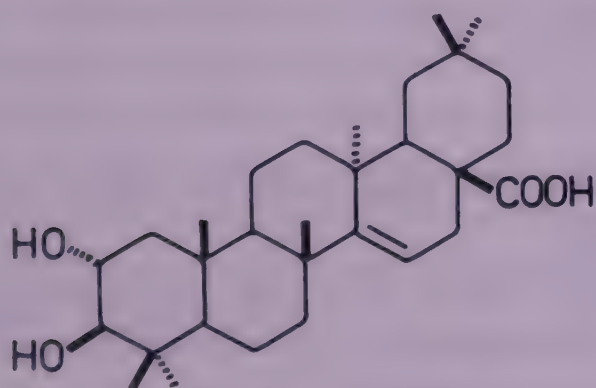
S. insigne (Royle) Benth. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 571).

Isolation of 3-O-acetylcycloart-23-en-25-ol from dried roots (*J. Nat. Prod.* 1985, 48, 496); new saponin from roots and its characterisation as stigmasta-5,22-diene-3 β -O-glucopyranoside (*Curr. Sci.* 1985, 54, 509); identification of β -sitosterol and taraxasterol in unsaponifiable fraction of fat from seeds by GC (*Natl. Acad. Sci. Lett.* 1986, 9, 307); a new flavone isolated from roots and characterised as 3-hydroxy-5,7,8-trimethoxyflavone (*Planta Med.* 1986, 52, 502).

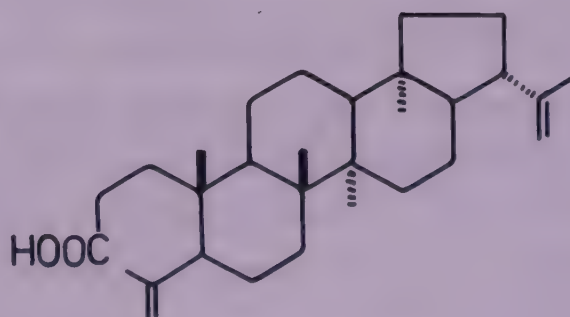
S. sebiferum (L.) Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 572).

Isolation and characterisation of new triterpenoid acid - sebiferenic acid - from bark; structure revision of sebiferic acid (*Phytochemistry* 1984, 23, 2593); 5,6,7,8-tetramethoxycoumarin and scopoletin isolated from roots whereas bark afforded 6,7,8-trimethoxycoumarin (*J. Nat. Prod.* 1985, 48, 486); gallic acid, astragalgin, (-)loliolide, kaempferol, quercetin and β -sitosterol glycoside isolated from leaves (*J. Nat. Prod.* 1988, 51, 619).

NEW COMPOUNDS



Sebiferenic acid



Sebiferic acid

BIOLOGICAL ACTIVITY

Gallic acid exhibited significant antileukaemic activity *in vitro* (*J. Nat. Prod.* 1988, 51, 619).

SARACA (Caesalpinaceae)

S. asoca (Roxb.) de Wilde syn. *S. indica* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 572).

Flower bud extract inhibited *Escherichia coli*, *Salmonella viballerup*, *Vibrio cholerae*, *Shigella dysenteriae* and *Shigella boydii* and this inhibition was stronger than that of flower extract (*Indian J. Med. Res.* 1985, 82, 188).

11'-Deoxyprocyanidin B isolated from root bark and its structure elucidated; (-)epicatechin and procyanidin B2 also isolated (*Z. Naturforsch.* 1985, 40B, 855; *Chem. Abstr.* 1985, 103, 119952 x); pods contained (+)catechol, (-)epicatechol and leucocyanidin; wood afforded quercetin whereas leucocyanidin and gallic acid isolated from flowers (*Leather Sci.* 1985, 32, 12; *Chem. Abstr.* 1985, 103, 68301 z).

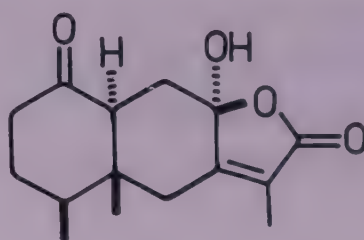
S. indica L.; see *S. asoca* (Roxb.) de Wilde

SARCANDRA (Chloranthaceae)

S. glabra (Thunb.) Nakai syn. *Chloranthus glaber* Makino, *C. brachystachys* Blume (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 572).

A new sesquiterpene lactone - (-)-istanbulin A - isolated from leaves (*Yaoxue Xuebao* 1988, 23, 64; *Chem. Abstr.* 1988, 109, 51702 g).

NEW COMPOUNDS



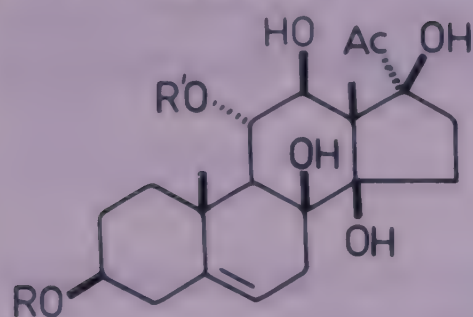
(-)-Istanbulin A

SARCOSTEMMA (Asclepiadaceae)

S. acidum (Roxb.) Voigt syn. *S. brevistigma* W. & A. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 573).

New pregnane ester diglycoside - brevinine - isolated from twigs and its structure elucidated as 11-O-benzoylsarcogenin-3-O- α -L-diginopyranosyl(1 \rightarrow 4)- α -L-diginopyranoside (*Phytochemistry* 1985, 24, 1341); another pregnane ester glycoside - brevine - also isolated from twigs and characterised as 11-O-benzoylsarcogenin-3-O- α -L-diginopyranosyl(1 \rightarrow 4)-O- α -L-diginopyranosyl(1 \rightarrow 4)-O- α -L-diginopyranoside (*Phytochemistry* 1985, 24, 3011); new pregnane genin - sarcogenin - isolated and its structure determined (*Phytochemistry* 1986, 25, 491); another pregnane derivative - bregenin - isolated from twigs and characterised as 3 β ,14 β ,16 α ,17 β -tetrahydroxypregn-5-en-20-one (*J. Nat. Prod.* 1987, 50, 600).

NEW COMPOUNDS



Brevine

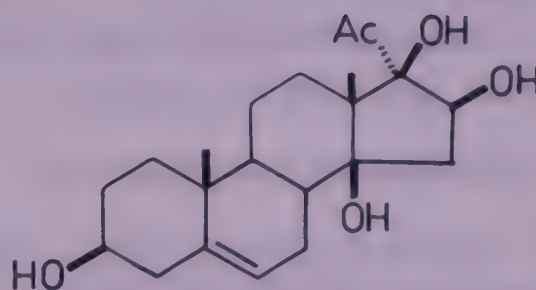
R = Diginose(4→1)Diginose(4→1)Diginose, R' = Benzoyl

Brevinine

R = Diginose(4→1)Diginose, R' = Benzoyl

Sarcogenin

R, R' = H



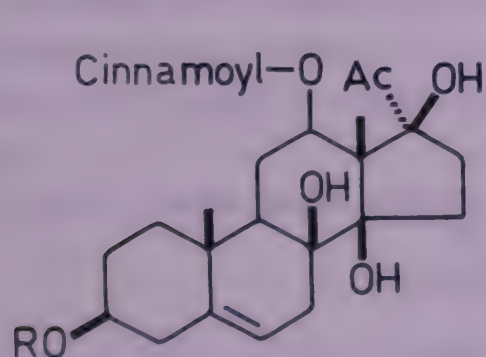
Bregenin

S. brevistigma W. & A.; see *S. acidum* (Roxb.) Voigt

S. secamone (L.) Bennet syn. *Oxystelma esculentum* (L.f.) R.Br. ex Schult., *O. secamone* (L.) Karst. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 184).

A new pregnane ester tetraglycoside - oxystine - isolated from roots and characterised as 12-O-cinnamoyl-desacetylmetaplexigenin-3-O-β-D-cymaropyranosyl(1→4)-O-β-D-thevetopyranosyl(1→4)-O-β-D-cymaropyranosyl(1→4)-O-β-D-digitoxopyranoside (*Phytochemistry* 1988, 27, 2297); another pregnane ester oligoglucoside - oxysine - isolated and its structure elucidated as calogenin-3-O-β-D-oleandropyranosyl(1→4)-O-β-D-thevetopyranosyl(1→4)-O-β-D-cymaropyranosyl(1→4)-O-β-D-digitoxopyranoside (*Phytochemistry* 1989, 28, 1211).

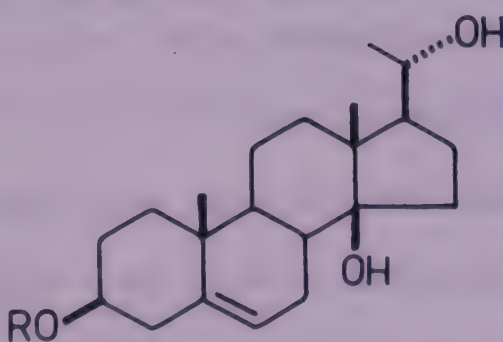
NEW COMPOUNDS



Oxystine

R = X-Cymarose

X = Digitoxose(4→1)Cymarose(4→1)Thevetose(4→1)



Oxysine

R = X-Oleandrose

S. stocksii Hook.f. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 222).

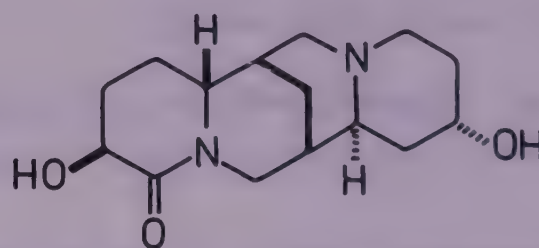
Isolation of friedelin, lupeol, α - and β -amyrins from whole plant (*J. Pharm.* 1986, 5, 55; *Chem. Abstr.* 1988, 108, 11064 y).

SAROTHAMNUS (Papilionaceae)

S. scoparius (L.) Wimm. ex W.D.J. Koch syn. *Cytisus scoparius* (L.) Link (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 573).

New isoflavone glucoside - 7-glucosyl-3'-O-methylorobol - isolated from flowers along with 3'-O-methylorobol and genistein (*Pharmazie* 1984, 39, 781; *Chem. Abstr.* 1985, 102, 146145 x); a new alkaloid - (-)3 β ,13 α -dihydroxylupanine - isolated and its absolute structure elucidated and confirmed by synthesis; tyramine, (-)sparteine, α -isosparteine, (-)17-oxosparteine, (+)lupanine and (+)13-hydroxylupanine also isolated (*Phytochemistry* 1986, 25, 521).

NEW COMPOUNDS



(-)3 β ,13 α -Dihydroxylupanine

SATUREJA (Lamiaceae)

S. montana L.

Eng. - Winter savory.

Oleanolic and crataegolic acids, eriodictyol-7-(6''-O- α -L-rhamnopyranosyl)- β -D-glucopyranoside and β -sitosterol- β -D-glucoside isolated (*J. Nat. Prod.* 1985, 48, 128).

Distribution : Kashmir.

SAUSSUREA (Asteraceae)

S. candicans (DC.) Sch.-Bip.; see *S. heteromalla* (D.Don) Hand.-Mazz.

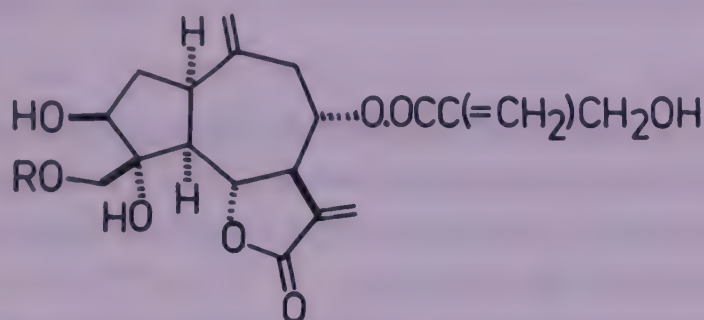
S. eriostemon Wall. ex Clarke; see *S. nepalensis* Spreng.

S. heteromalla (D.Don) Hand.-Mazz. syn. *S. candicans* (DC.) Sch.-Bip. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 222).

Two triterpene glycosides - dihydroprotopanaxadiol-di-O-arabinoside and protopanaxanone-di-O-arabinoside - isolated (*Himalayan Chem. Pharm. Bull.* 1985, 2, 14; *Chem. Abstr.*

1986, 104, 203840 n); isolation of three new oxygenated guaianolides (I, II and III) and their characterisation as 15-deschloro-15-hydroxychlorojanerin, 15-deschloro-15-methoxychlorojanerin and 15-deschloro-15-acetoxychlorojanerin respectively (*Phytochemistry* 1988, 27, 1203).

NEW COMPOUNDS



I

R = H

II

R = Me

III

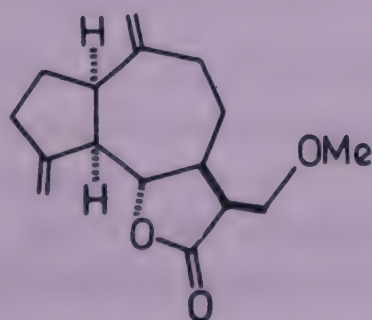
R = Ac

S. lappa (Decne.) Sch.-Bip. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 575).

Plant extract exhibited cholagogic and antiulcer effects in mice (*Chem. Pharm. Bull.* 1985, 33, 1285); root yielded oil (20.0%) which when injected in BALB/c mice inhibited growth of Meth-A tumor cells and appeared promising as a non-specific agent for cancer immunotherapy (*Gan to Kagaku Ryoho* 1987, 14, 2276; *Chem. Abstr.* 1987, 107, 146946 n).

Stereochemistry of two guaianolides - isodehydrocostuslactone and isozaluzanin C - confirmed (*Phytochemistry* 1984, 23, 2855); isolation of antimutagenic costunolide from roots (*J. Nat. Prod.* 1986, 49, 1112; *Jpn.* 6,281,312 (1987) Apr. 14; *Chem. Abstr.* 1987, 107, 64841 k); dehydrocostuslactone also isolated from roots (*J. Nat. Prod.* 1986, 49, 1112); a new guaianolide - 12-methoxy-dihydrodehydrocostuslactone - isolated and characterised (*Phytochemistry* 1987, 26, 1209).

NEW COMPOUNDS



12-Methoxy-dihydrodehydrocostuslactone

BIOLOGICAL ACTIVITY

Costunolide exhibited cholagogic and antiulcer effects in mice (*Chem. Pharm. Bull.* 1985, 33, 1285); it inhibited KC1-induced contractions of aorta but the effect was less on norepinephrine-induced contractions, indicating a possible calcium antagonistic action. Dehydrocostuslactone showed similar effects but its specific inhibition of KC1-induced contraction was less than that of costunolide (*J. Nat. Prod.* 1986, 49, 1112).

***S. medusa* Maxim.**

Plant polysaccharide concentration-dependently increased amplitude, frequency and tonus of uterine contraction in isolated uterus of rats, at every stage of sexual cycle; effects being more obvious on estrous uterus than on nonestrous uterus (*Yaoxue Xuebao* 1986, 21, 220; *Chem. Abstr.* 1986, 104, 180194 p).

Thermopsoside (chrysoeriol-7-O- β -D-glucoside), rutin and 7-O- β -D-glucosides of apigenin and luteolin isolated from aerial parts (*Lanzhou Daxue Xuebao, Ziran Kexueban* 1984, 20, 128; *Chem. Abstr.* 1985, 102, 163701 t; *Gaodeng Xuexiao Huaxue Xuebao* 1986, 7, 789; *Chem. Abstr.* 1987, 106, 81621 k).

Distribution : Kashmir, Ladakh and Nepal.

***S. nepalensis* Spreng. syn. *S. eriostemon* Wall. ex Clarke**

Vanillic acid, β -sitosterol and arborinine isolated from whole plant (*Indian J. Chem.* 1989, 28B, 356).

Distribution : Nepal.

***S. obvallata* (DC.) Edgew.** (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 223).

Aspartic acid, α -alanine, β -alanine, glycine, histidine, leucine, isoleucine, lysine, methionine, phenylalanine, serine, threonine and tryptophan identified in stems (*Indian J. For.* 1986, 9, 312; *Chem. Abstr.* 1987, 107, 214842 c).

SAXIFRAGA (Saxifragaceae)

S. purpurascens Hook.f. & Thoms.; see *Bergenia purpurascens* (Hook.f. & Thoms.) Engl.

SCAPHIUM (Sterculiaceae)

***S. scaphigerum* (Wall. ex G.Don) Guibourt** syn. *S. wallichii* Schott & Endl., *Sterculia scaphigera* Wall. ex G.Don (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 223).

Fruits afforded histamine (*Fitoterapia* 1988, 59, 338).

Distribution : Introduced into Indian Botanic Garden, Howrah.

S. wallichii Schott & Endl.; see *S. scaphigerum* (Wall. ex G.Don) Guibourt

SCEPTRIDIUM (Botrychiaceae)

S. ternatum (Thunb.) Lyon var. *ternatum*; see *Botrychium ternatum* (Thunb.) Sw.

SCHEFFLERA (Araliaceae)

S. impressa (Clarke) Harms syn. *Heptapleurum impressum* Clarke

Lepcha - Suntong; Nep. - Balu chinia, Bhalu chinde, Bhalu phutta.

Two new triterpenoid saponins isolated from bark and stem and characterised as 3 β ,23-dihydroxyurs-12-en-28-oic acid-3-O- β -D-glucuronopyranoside-6'-O-methyl ester and 4-epi-hederagenin-3-O- β -D-glucuronopyranoside-6'-O-methyl ester respectively; oleanolic acid, 23-hydroxyursolic acid, hederagenin and its 3-O- β -D-glucuronopyranoside-6'-O-methyl ester also isolated (*Phytochemistry* 1989, 28, 644).

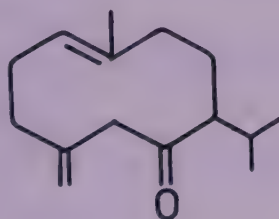
Distribution : Himalayas, Kashmir to Bhutan and north-eastern India, alt. 1800-3300 m.

SCHINUS (Anacardiaceae)

S. molle L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 576).

Isolation of preisocalamenediol from leaves (*Planta Med.* 1987, 53, 230); β -elemenic acid isolated from seeds (*Rev. Latinoam. Quim.* 1989, 20, 69; *Chem. Abstr.* 1989, 111, 229025 v).

NEW COMPOUNDS



Preisocalamenediol

S. terebinthifolius Raddi (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 576).

Amentoflavone, 2,3-dihydroamentoflavone and tetrahydroamentoflavone isolated from drupes together with gallic acid (*Z. Naturforsch.* 1986, 41B, 1476; *Chem. Abstr.* 1987, 106, 64327 b); isolation of n-alkylphenols from drupes (*Z. Naturforsch.* 1987, 42C, 7; *Chem. Abstr.* 1987, 106, 210966 c).

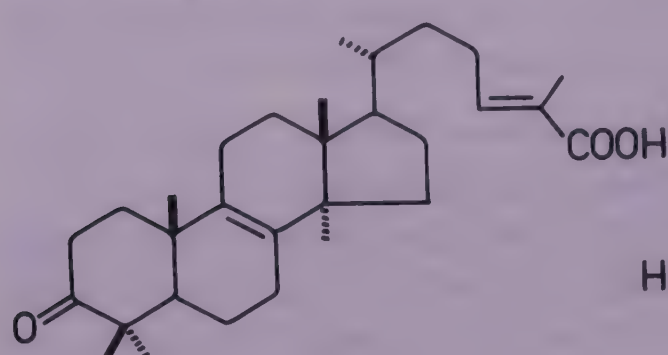
SCHISANDRA (SCHIZANDRA) (Schisandraceae)

S. propinqua (Wall.) Baill. var. *propinqua*

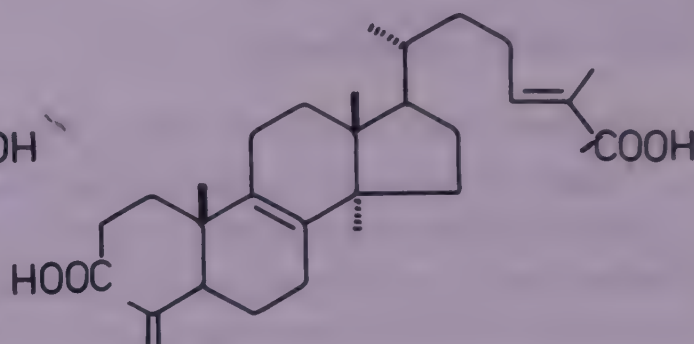
Two new triterpenoid acids - anwuweizonic acid and manwuweizic acid - isolated (*Can. J. Chem.* 1988, 66, 414).

Distribution : Himalayas, from Garhwal to Sikkim, alt. 1200-2100 m.

NEW COMPOUNDS



Anwuweizonic acid



Manwuweizic acid

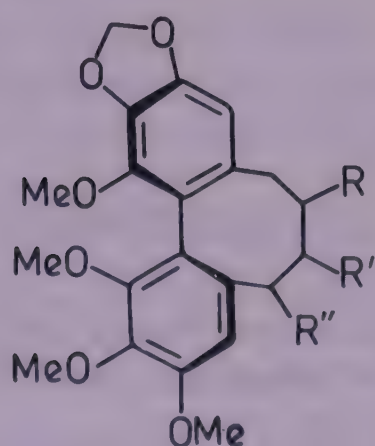
BIOLOGICAL ACTIVITY

Manwuweizic acid exhibited significant inhibitory activity against Lewis lung cancer, brain tumor-22 and solid hepatoma in mice (*Can. J. Chem.* 1988, 66, 414).

S. rubriflora Rehd. & Wils. syn. *S. sphenanthera* sensu Kanjilal (non Rehd. & Wils.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 577).

Four new lignans - (-)rubschisandrin, rubschisantherin, schisanhenol acetate and schisanhenol B - isolated from kernels and their structures established; wuweizisu C, deoxyschisan-drin, schisanhenol and gomisin O also isolated (*Yaoxue Xuebao* 1985, 20, 832; *Chem. Abstr.* 1986, 105, 3521 t).

NEW COMPOUNDS

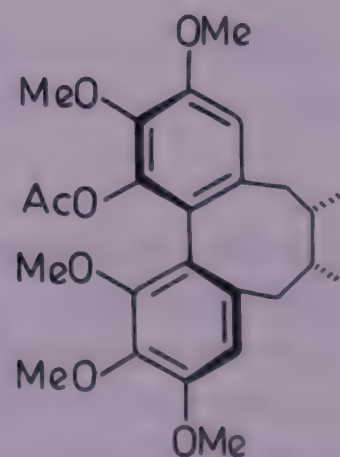


Rubschisandrin

$R, R' = \beta\text{-Me}, R'' = \text{H}$

Rubschisantherin

$R, R' = \alpha\text{-Me}, R'' = \text{OAc}$



Schisanhenol acetate

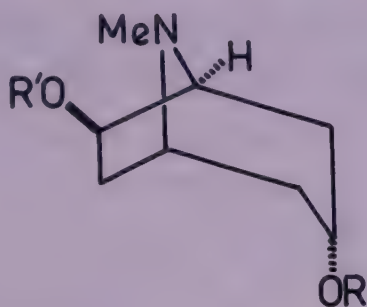
S. sphenanthera Rehd. & Wils.; see *S. rubriflora* Rehd. & Wils.

SCHIZANTHUS (Solanaceae)

S. pinnatus Ruiz & Pav. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 617).

Seven new tropan-3 α ,6 β -diol ester - schizanthines F, G, H, I, K, L and M - isolated together with tropine, (-)-6 β -angeloyloxytropan-3 α -ol, (-)-6 β -tigloyloxytropan-3 α -ol and (-)-3 α -seneciolyoxytropan-6 β -ol isolated; new compounds characterised (*Heterocycles* 1988, 27, 1887).

NEW COMPOUNDS



Schizanthine F

R = COCH=C(Me)COOMe, R' = Tigloyl

Schizanthine G

R = COCH₂C(=CH₂)COOMe, R' = Tigloyl

Schizanthine H

R = COCH₂C(=CH₂)COOMe, R' = Angeloyl

Schizanthine I

R = COCH=C(Me)COOMe, R' = Angeloyl

Schizanthine K

R = COCH=C(Me)COOEt, R' = Tigloyl

Schizanthine L

R = COCH₂C(=CH₂)COOEt, R' = Angeloyl

Schizanthine M

R = COCH₂C(=CH₂)COOEt, R' = Tigloyl

SCHLEICHERA (Sapindaceae)

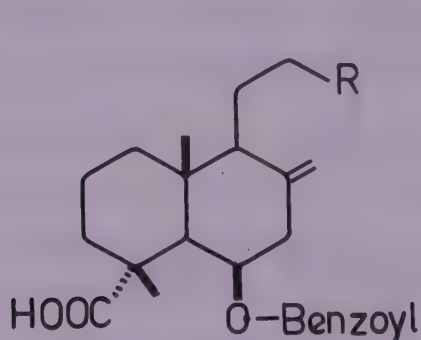
S. oleosa (Lour.) Oken (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 617).

Betulin, betulinic acid, lupeol, its acetate, β -sitosterol and scopoletin isolated from bark (*Fitoterapia* 1986, 57, 445).

SCOPARIA (Scrophulariaceae)

S. dulcis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 578).

A new diterpenoid - scoparic acid A - isolated and its structure elucidated (*Chem. Pharm. Bull.* 1987, 35, 3963; *Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1987, 29, 544; *Chem. Abstr.* 1988, 109, 129350 n); scoparic acids B and C also isolated and characterised (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1987, 29, 544; *Chem. Abstr.* 1988, 109, 129350 n); another two new diterpenoids - scopadulcic acids A and B - isolated from whole plant and their absolute configurations determined (*Tennen Yuki Kagobutsu Toronakai Koen Yoshishu* 1987, 29, 544; *Chem. Abstr.* 1988, 109, 129350 n; *Tetrahedron Lett.* 1987, 28, 3693); crystal structure of scopadulcic acid A (*J. Nat. Prod.* 1988, 51, 360); hymenoxin (5,7-dihydroxy-6,8,3',4'-tetramethoxyflavone) isolated (*Chem. Pharm. Bull.* 1988, 36, 4849).

NEW COMPOUNDS

Scoparic acid A

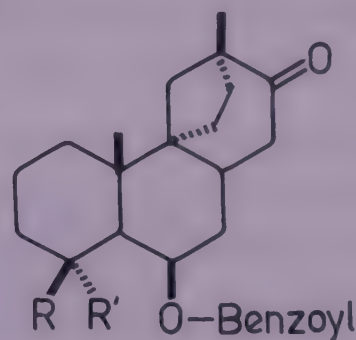
$R = C(Me) = CHCH_2OH$

Scoparic acid B

$R = Ac$

Scoparic acid C

$R = C(CHO) = CH_2$



Scopadulcic acid A

$R = COOH, R' = CH_2OH$

Scopadulcic acid B

$R = Me, R' = COOH$

BIOLOGICAL ACTIVITY

Scopadulcic acid B inhibited replication of *Herpes simplex* virus type I; *in vitro* therapeutic index, 16.7. Its effect on the course of primary corneal *Herpes simplex* virus infection in hamster model investigated. Scopadulcic acid B (0.1 and 0.2 g/kg/day) when given orally or i.p., immediately after virus inoculation, effectively delayed appearance of herpetic lesions and prolonged survival time (*Antiviral Res.* 1988, 9, 345; *Chem. Abstr.* 1989, 110, 88049 w); hymenoxin was cytotoxic to cultured human HeLa cells (*Chem. Pharm. Bull.* 1988, 36, 4849).

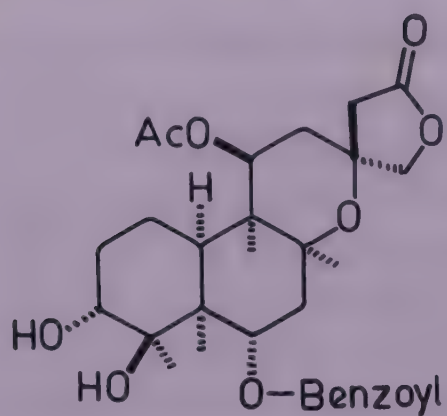
SCUTELLARIA (Lamiaceae)

S. angulosa Benth.; see *S. scandens* Buch.-Ham. ex D. Don

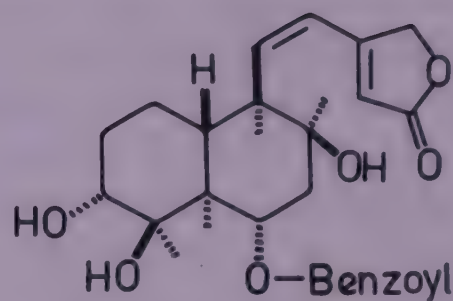
S. barbata D.Don syn. *S. rivularis* Wall. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 578).

A new flavone - 7-hydroxy-5,8-dimethoxyflavone - isolated from aerial parts along with apigenin (*Shoyakugaku Zasshi* 1984, 38, 249; *Chem. Abstr.* 1985, 102, 137639 j; *Kuo Li Chung-kuo I Yao Yen Chiu So Yen Chiu Pao Kao* 1984, 141; *Chem. Abstr.* 1985, 102, 92951 m); another new flavone - 5,7-dihydroxy-8,2'-dimethoxyflavone - together with baicalein, skullcapflavone I and 5,6,2'-trihydroxy-7,8-dimethoxyflavone isolated from whole plant (*Shoyakugaku Zasshi* 1984, 38, 249; *Chem. Abstr.* 1985, 102, 137639 j); isolation and characterisation of 5,7,4'-trihydroxy-8-methoxyflavanone from aerial parts (*Kuo Li Chung-Kuo I Yao Yen Chiu So Yen Chiu Pao Kao* 1984, 141; *Chem. Abstr.* 1985, 102, 92951 m; *Shoyakugaku Zasshi* 1986, 40, 432; *Chem. Abstr.* 1987, 107, 46134 c); p-hydroxybenzylacetone, p-hydroxybenzaldehyde, wogonin and its 4'-hydroxy derivative, rivularin, naringenin, scutevulin, hispidulin, eriodictyol, luteolin, 5,7,4'-trihydroxy-6-methoxyflavanone, phytosterol and its glucoside, p-coumaric, protocathechuic and ursolic acids also isolated from aerial parts (*Kuo Li Chung-Kuo I Yao Yen Chiu So Yen Chiu Pao Kao* 1984, 141; *Chem. Abstr.* 1985, 102, 92951 m); whole plant also afforded 5,7,2'-trihydroxyflavone, chrysin, luteolin, hispidulin, cirsilineol, alpinetin and cardamonin (*Shoyakugaku Zasshi* 1986, 40, 432; *Chem. Abstr.* 1987, 107, 46134 c); aurantiamide acetate (0.04%) determined in aerial parts (*Planta Med.* 1987, 53, 507); a neoclerodane-type diterpene - scutellone A - and its characterisation (*J. Chem. Res. Synop.* 1987, 320; *Chem. Abstr.* 1988, 109, 54992 n); another neoclerodane-type diterpene - scutellone B - isolated from aerial parts and its structure elucidated (*Chem. Express* 1988, 3, 37; *Chem. Abstr.* 1989, 110, 135521 f; *Chem. Pharm. Bull.* 1989, 37, 582); isolation of new diterpenoid lactone - scuterivulactone C2 - and its 2D-NMR; scuterivulactones A, B and C1 (scutellone A) also isolated (*Chem. Lett.* 1987, 987; *Chem. Abstr.* 1988, 108, 75656 a); two more new diterpenoids - scutellones C and F - obtained from aerial parts and their structures determined (*Heterocycles* 1988, 27, 779); another diterpenoid lactone - scuterivulactone D (scutellone D) - isolated and its 2D-NMR determined (*Chem. Pharm. Bull.* 1987, 35, 1656; *ibid.* 1988, 36, 2642); scutellone E isolated from aerial parts and its structure determined by X-ray analysis (*Chem. Pharm. Bull.* 1988, 36, 2642); a new triterpene - scutellaric acid - and its characterisation (*Chem. Pharm. Bull.* 1988, 36, 3619); new clerodane-type diterpenoid - scutellone G - from aerial parts and its structure elucidation (*Chem. Express* 1988, 3, 343; *Chem. Abstr.* 1989, 111, 112276 m; *Chem. Pharm. Bull.* 1989, 37, 582); in addition scutellones H and I isolated from aerial parts and characterised (*Chem. Pharm. Bull.* 1989, 37, 582).

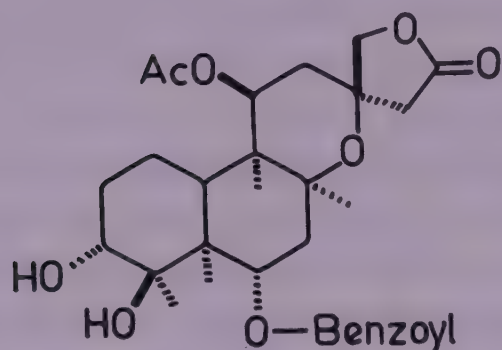
NEW COMPOUNDS



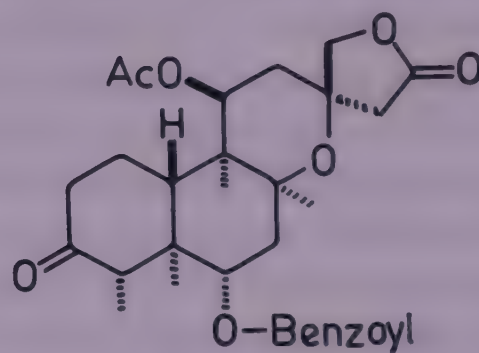
Scuterivulactone C2



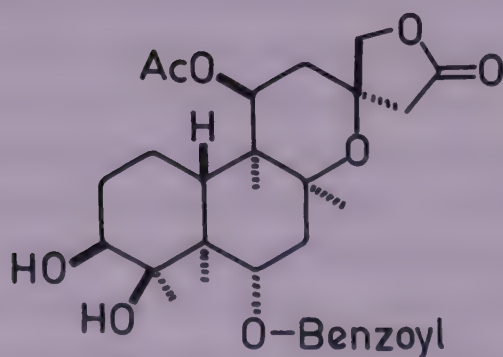
Scuterivulactone D



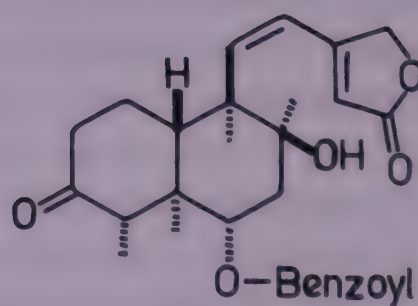
Scutellone A



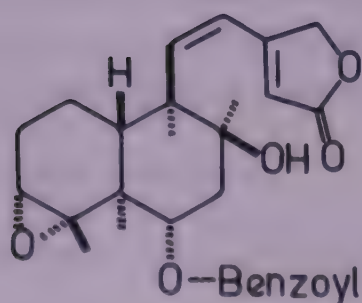
Scutellone B



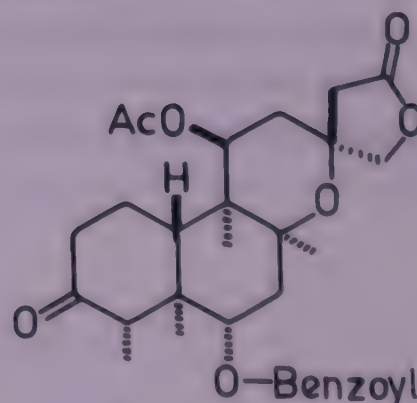
Scutellone C



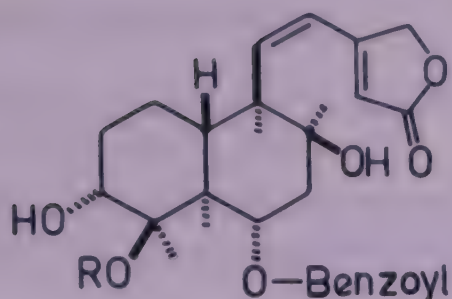
Scutellone E



Scutellone F



Scutellone G

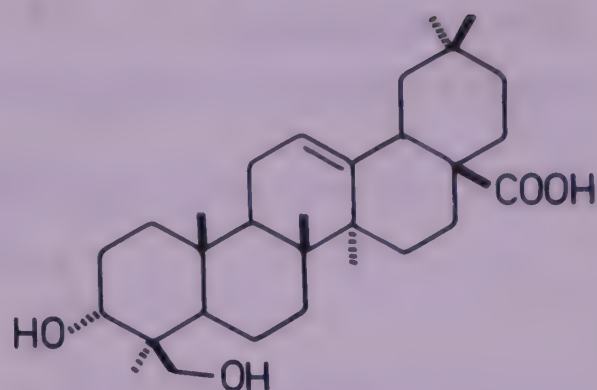


Scutellone H

R = Et

Scutellone I

R = Me



Scutellaric acid

S. discolor Wall. ex Benth.

Four new flavanones - 2(S)5,7-dihydroxy-8,2'-dimethoxyflavanone, 2(S)7-hydroxy-5,8,2'-trimethoxyflavanone, 5,2'-dihydroxy-7,8,6'-trimethoxyflavanone and 5,2'-dihydroxy-6,7,6'-trimethoxyflavanone - and a new chalcone - 2',4'-dihydroxy-2,3',6'-trimethoxychalcone - isolated from roots along with wogonin, its 7-O-glucuronide, norwogonin, 5,7,2'-trihydroxy-8-methoxyflavone and 5,7-dihydroxy-8,2'-dimethoxyflavone (*Chem. Pharm. Bull.* 1985, 33, 4457); roots also afforded new flavones - 7-hydroxy-5,8,2'-trimethoxyflavone and 5,7-dihydroxy-8,2',6'-trimethoxyflavone - together with 7-hydroxy-5,8-dimethoxyflavone, 5,7,4'-trihydroxy-8-methoxyflavone, 5,7,2'-trihydroxy-8,6'-dimethoxyflavone, norwogonin-7-O-glucuronide and pinocembrin (*Chem. Pharm. Bull.* 1986, 34, 406); isolation of two new flavones - 5,7,8-trihydroxyflavone-8-O- β -D-glucoside and 5,7,2',6'-tetrahydroxy-8-methoxyflavone-2'-O- β -D-(2''-O-caffeoyl)glucoside - from aerial parts; chrysin and its 7-O-glucuronide, wogonin, apigenin, luteolin, 5,7-dihydroxy-8,2'-dimethoxyflavone, 5,7,4'-trihydroxy-8-methoxyflavone and 5,7-dihydroxy-8,2',6'-trimethoxyflavone also isolated (*Chem. Pharm. Bull.* 1988, 36, 3654).

Distribution : Himalayas, from Kumaon to Assam, alt. 300-1800 m, Khasia Hills, alt. 1200-1800 m and Western Ghats.

S. rivularis Wall.; see *S. barbata* D.Don

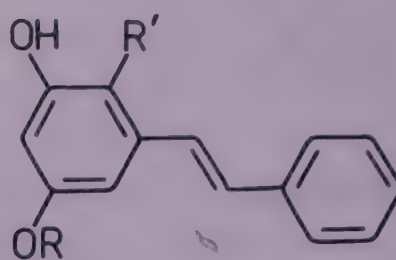
S. scandens Buch.-Ham. ex D.Don syn. *S. angulosa* Benth.

Garhwali - Kappu.

Two stilbenes (I and II) along with pinosylvin and gaylussacin isolated from leaves (*Shoyakugaku Zasshi* 1988, 42, 204; *Chem. Abstr.* 1989, 110, 141364 y).

Distribution : Himalayas, Kashmir to Nepal, alt. 800-2700 m.

NEW COMPOUNDS



I

R = Glu, R' = H

II

R = H, R' = COOH

SECALE (Poaceae)

S. cereale L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 579).

Two luteolin glucuronides - luteolin-7-O-(β -D-glucuronosyl(1 \rightarrow 2)- β -D-glucuronide)-4'-O- β -D-glucuronide and luteolin-7-O- β -D-glucuronosyl(1 \rightarrow 2)- β -D-glucuronide - isolated from leaves (*Phytochemistry* 1985, 24, 343); isolation of cyanidin-3-O-gentiobioside from leaves (*Z. Naturforsch.* 1986, 41C, 485; *Chem. Abstr.* 1986, 105, 21695 g); new hydroxycinnamic acid esters isolated from leaves and identified as positional isomers of (E)O-feruloylgluconic acid wherein 2(E)O-feruloylgluconic acid predominated; a glucaric acid derivative - 2(E)O-feruloyl-4-methoxyaldaric acid - also isolated as minor constituent (*Phytochemistry* 1986, 25, 2605).

SECHIUM (Cucurbitaceae)

S. edule (Jacq.) Sw. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 619).

Mixture of steroidal glucosides from flowers exhibited anti-inflammatory and cardiac activities (*Rev. Latinoam. Quim.* 1987, 18, 132; *Chem. Abstr.* 1988, 108, 183619 z).

Mixture of steroidal glucosides from flowers shown by HPLC to consist of stigmasterol- β -D-glucoside and sitosterol- β -D-glucoside (*Rev. Latinoam. Quim.* 1987, 18, 132; *Chem. Abstr.* 1988, 108, 183619 z); glucosides of sitosterol and stigmasterol isolated from fruits (*Rev. Colomb. Cienc. Quim.-Farm.* 1987, 16, 15; *Chem. Abstr.* 1989, 110, 33460 t).

BIOLOGICAL ACTIVITY

β -Sitosterol- and stigmasterol- β -D-glucosides exhibited anti-inflammatory activity in rat paw oedema (*Rev. Colomb. Cienc. Quim.-Farm.* 1987, 16, 15; *Chem. Abstr.* 1989, 110, 33460 t).

SECURIGERA (Papilionaceae)

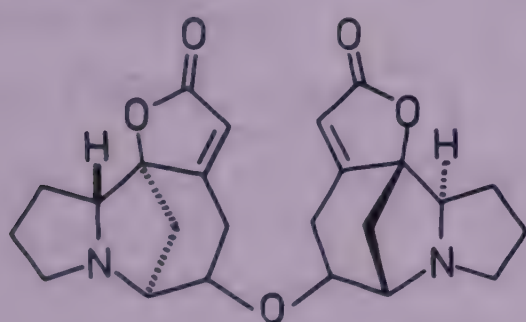
S. securidaca (L.) Degen. & Dorf. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 366).

Isolation of saponaretin, scopoletin and umbelliferone from aerial parts (*Khim. Prir. Soedin.* 1987, 298; *Chem. Abstr.* 1987, 107, 36662 j).

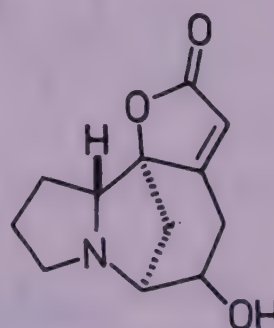
SECURINEGA (Euphorbiaceae)

S. virosa (Roxb. ex Willd.) Baillon syn. *Flueggea virosa* (Roxb. ex Willd.) Baillon, *F. microcarpa* Blume, *F. microcarpa* (Roxb. ex Willd.) Baillon (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 579).

Gallic and ellagic acids, quercetin, bergenin, β -sitosterol glucoside and Nb-methyl-tetrahydro- β -carboline isolated from leaves (*Planta Med.* 1985, 51, 466); two new alkaloids - fluggeaine ether and fluggeainol - isolated along with virosecurinine, norsecurinine, hentriacontane, glochidonol and β -sitosterol (*Zhiwu Xuebao* 1985, 27, 625; *Chem. Abstr.* 1986, 104, 183282 b); isolation of 3 β -hydroxylanostane-24,25-ether, lupeol, bergenin, taraxerol, stigmasterol and β -sitosterol from aerial parts (*J. Indian Chem. Soc.* 1988, 65, 738).

NEW COMPOUNDS

Fluggeaine ether



Fluggeainol

SEDUM (Crassulaceae)

S. crassipes Wall. ex Hook.f. & Thoms; see *S. wallichianum* Hook.

S. wallichianum Hook. syn. *S. crassipes* Wall. ex Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 368).

Paeonoside and laricitrin isolated from roots (*Planta Med.* 1988, 54, 89).

SELINUM (Apiaceae)

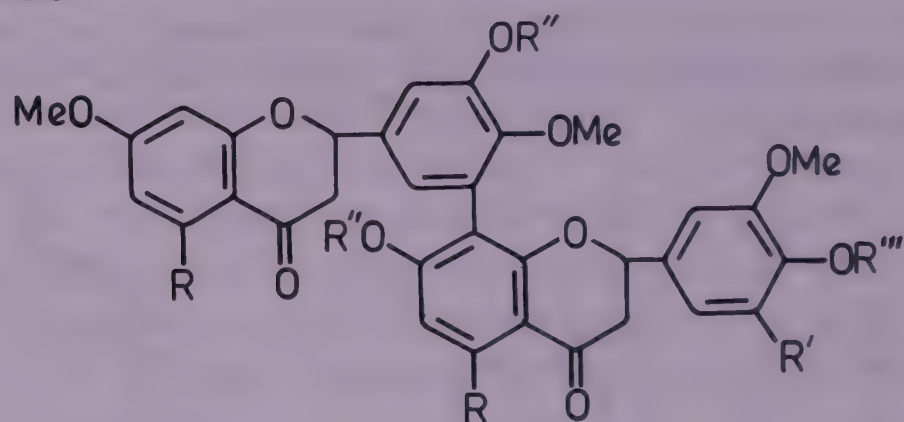
S. monnieri L.; see *Cnidium monnieri* (L.) Cusson

SEMECARPUS (Anacardiaceae)

S. anacardium L.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 580).

Chloroform extract of nuts significantly increased life-span in ascites tumor systems (L-1210, P-388, advanced P-388 and sublines of P-388 resistant to adriamycin or vincristine) and solid tumor systems (B-16 melanoma and Glioma-26) (*Indian J. Exp. Biol.* 1980, 18, 6).

Isolation of a biflavonoid - jeediflavanone - from nutshells (*Phytochemistry* 1985, 24, 1065); another biflavonoid - galluflavanone - from nutshells (*Indian J. Chem.* 1985, 24B, 398); a third biflavonoid - semecarpuf flavanone - from nutshells (*Proc. Indian Acad. Sci., Chem. Sci.* 1986, 97, 63); a new dimeric flavonoid - nallaflavanone - isolated and its structure determined and confirmed (*Chim. Acta Turc.* 1988, 16, 241; *Chem. Abstr.* 1989, 111, 232378 t); isolation of another new biflavonoid - semecarpetin - from nutshells and its characterisation (*Phytochemistry* 1988, 27, 3020).

NEW COMPOUNDS**Nallaflavanone**

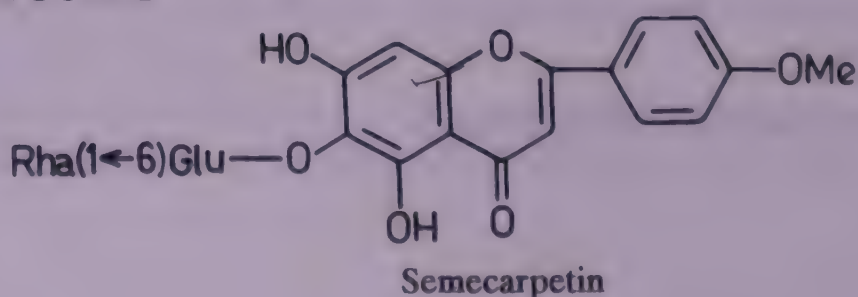
R = OH, R' = OMe, R'' = Me, R''' = H

Semecarpetin

R, R', R'' = H, R''' = Me

S. kurzii Engler (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 581).

Isoricinoleic acid (10.5%) determined in seed oil (*J. Am. Oil Chem. Soc.* 1985, 62, 1702; *Chem. Abstr.* 1986, 104, 85379 u); a new flavone glycoside - semecarpetin - isolated from leaves and characterised (*Chem. Ind.* 1987, 528).

NEW COMPOUNDS

Note : Trivial name semecarpetin assigned to two different compounds as given under *S. anacardium* and *S. kurzii*.

SENEBIERA (Brassicaceae)

S. didyma (L.) Pers.; see *Coronopus didymus* (L.) Smith

S. pinnatifida DC.; see *Coronopus didymus* (L.) Smith

SENECIO (Asteraceae)

S. amnicoides (DC.) Clarke; see *Cremanthodium amnicoides* (DC.) Good

S. thomsonii Clarke; see *Ligularia thomsonii* (Clarke) Pojark

S. vulgaris L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 583).

Crystal structure of retronecine (*Acta Crystallogr., Cryst. Struct. Commun.* 1985, 41C, 1342; *Chem. Abstr.* 1986, 104, 51008 g); isolation of two pyrrolizidine alkaloids - spartioidine and usaramine - and their ¹³C-NMR (*Planta Med.* 1988, 54, 178).

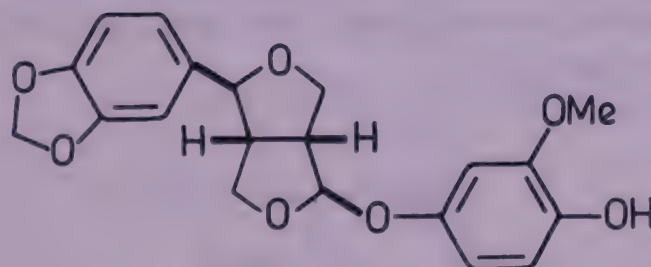
SESAMUM (Pedaliaceae)

S. indicum L.; see *S. orientale* L.

S. orientale L. syn. *S. indicum* L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 371).

A new antioxidant - sesamolinol - along with sesamol and γ -tocopherol isolated from seeds and its crystal structure determined (*Agric. Biol. Chem.* 1985, 49, 3351).

NEW COMPOUNDS



Sesamolinol

BIOLOGICAL ACTIVITY

Sesamolinol exhibited stronger antioxidative activity than vitamin E in *in vitro* microsome assays (*Agric. Biol. Chem.* 1985, 49, 3351).

SESBANIA (Papilionaceae)

S. aegyptiaca (Poir.) Pers.; see *S. sesban* (L.) Merr.

S. grandiflora (L.) Poir. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 583).

Aqueous extract of flowers caused haemolysis of human and sheep erythrocytes; active principle was identified as methyl oleanolate (*Fitoterapia* 1985, 56, 188).

Isolation of kaempferol-3,7-diglucoside, (+)leucocyanidin and cyanidin-3-glucoside from seeds (*Fitoterapia* 1986, 57, 293).

S. sesban (L.) Merr. syn. *S. aegyptiaca* (Poir.) Pers. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 584).

A new saponin - stigmasta-5,24(28)diene-3 β -O- β -D-galactopyranoside - isolated from seeds and its structure determined (*Fitoterapia* 1988, 59, 478); isolation of 3-O-[α -L-rhamnopyranosyl(1 \rightarrow 3)- β -D-glucuronopyranosyl]-oleanolic acid from aerial parts (*Planta Med.* 1988, 54, 225).

BIOLOGICAL ACTIVITY

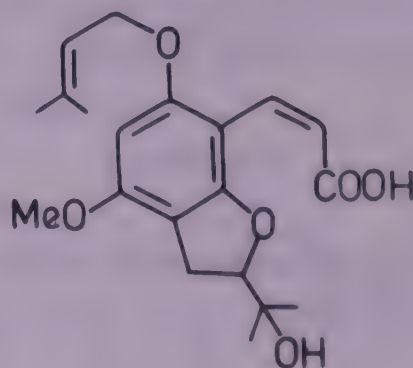
3-O-[α -L-Rhamnopyranosyl(1 \rightarrow 3)- β -D-glucuronopyranosyl]-oleanolic acid exhibited molluscicidal activity (*Planta Med.* 1988, 54, 225).

SESELI (Apiaceae)

S. daucifolium Clarke; see *Cnidium monnieri* (L.) Cusson

S. libanotis (L.) W. Koch syn. *S. sibiricum* Benth. ex Clarke (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 584).

Stereoselective synthesis of sibiricine (*Chem. Pharm. Bull.* 1985, 33, 2621); isolation of a new cinnamic acid derivative - sesebrinic acid - from aerial parts and its structure elucidation (*Phytochemistry* 1987, 26, 1817).

NEW COMPOUNDS

Sesebrinic acid

S. sibiricum Benth. ex Clarke; see *S. libanotis* (L.) W. Koch

SHOREA (Dipterocarpaceae)

S. robusta Gaertn. f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 585).

Crystal structure of 12 α -hydroxy-3-oxo-oleanano-28,13-lactone (*Acta Crystallogr., Cryst. Struct. Commun.* 1987, 43C, 1229; *Chem. Abstr.* 1988, 109, 23139 k); epi- ψ -taraxastanol, β -sitosterol, hydroxyhopanone, dammarenediol II, dipterocarpol, dammarenic acid, asiatic acid and α -amyrin isolated from resin (*Indian Drugs* 1989, 26, 146).

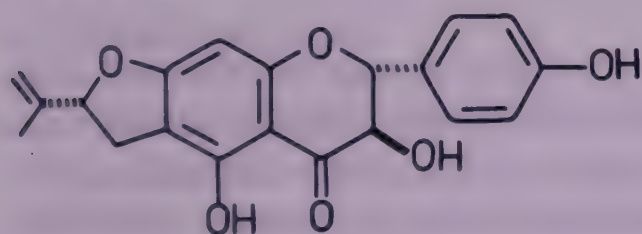
SHUTERIA (Papilionaceae)

S. involucrata (Wall.) Wt. & Arn. var. *glabrata* (Wt. & Arn.) Ohashi syn. *S. vestita* Wt. & Arn., *S. vestita* Wt. & Arn. var. *glabrata* (Wt. & Arn.) Baker

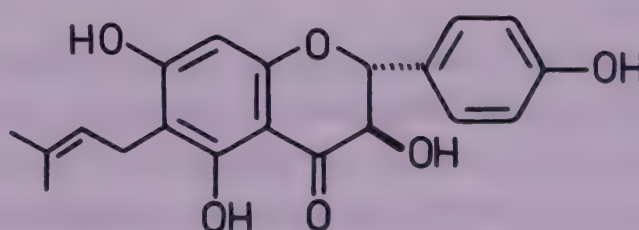
Four new dihydroflavonol phytoalexins - shuterol, shuterin and isomeric shuterones A and B - isolated from fungus-inoculated leaflets and their structures determined (*J. Nat. Prod.* 1986, 49, 631).

Distribution : Himalayas, from Himachal Pradesh eastwards to Assam, alt. 900-2100 m, in Khasia and Mishmi Hills and hills of peninsular India, alt. 600-1800 m.

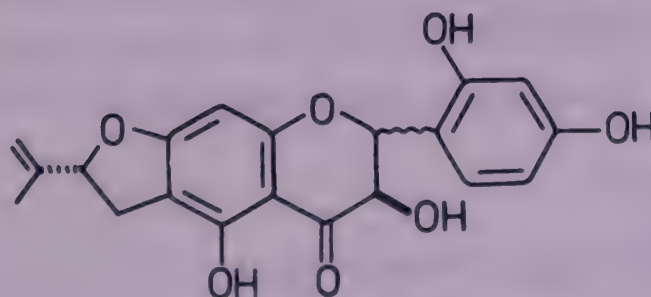
NEW COMPOUNDS



Shuterol



Shuterin



Shuterone A

~ = α

Shuterone B

~ = β

S. vestita Wt. & Arn.; see *S. involucrata* (Wall.) Wt. & Arn. var. *glabrata* (Wt. & Arn.) Ohashi
S. vestita Wt. & Arn. var. *glabrata* (Wt. & Arn.) Baker; see *S. involucrata* (Wall.) Wt. & Arn.
 var. *glabrata* (Wt. & Arn.) Ohashi

SIDA (Malvaceae)

S. acuta Burm.f. ssp. *acuta* syn. *S. carpinifolia* sensu Masters (non L.f.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 586).

Isolation of α -amyrin, ecdysterone, ephedrine and cryptolepine from roots (*Fitoterapia* 1984, 55, 249); pristane, phytane, hentriacontane, nonacosane, cholesterol, campesterol, stigmasterol, β -sitosterol and stigmast-7-enol isolated from aerial parts (*Indian Drugs* 1988, 25, 184).

S. carpinifolia L.f.; see *S. acuta* Burm.f. ssp. *acuta*

S. cordata (Burm.f.) Borssum syn. *S. veronicaefolia* Lamk., *S. humilis* Cav. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 586).

Cholesterol and stigmasterol isolated (*Pharmazie* 1989, 44, 74; *Chem. Abstr.* 1989, 110, 141374 b).

S. cordifolia L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 227).

Sterculic, malvalic and coronaric acids isolated from seed oil along with other fatty acids (C14:0, C16:0, C18:0, C18:1, C18:2, C18:3) (*Chem. Ind.* 1985, 483); ephedrine isolated from stems and roots (*Curr. Sci.* 1985, 54, 690); identification of palmitic, stearic and hexacosanoic acids and β -sitosterol in aerial parts (*J. Bangladesh Acad. Sci.* 1989, 13, 55; *Chem. Abstr.* 1989, 111, 130747 v).

S. humilis Cav.; see *S. cordata* (Burm.f.) Borssum

S. veronicaefolia Lamk.; see *S. cordata* (Burm.f.) Borssum

SILENE (Caryophyllaceae)

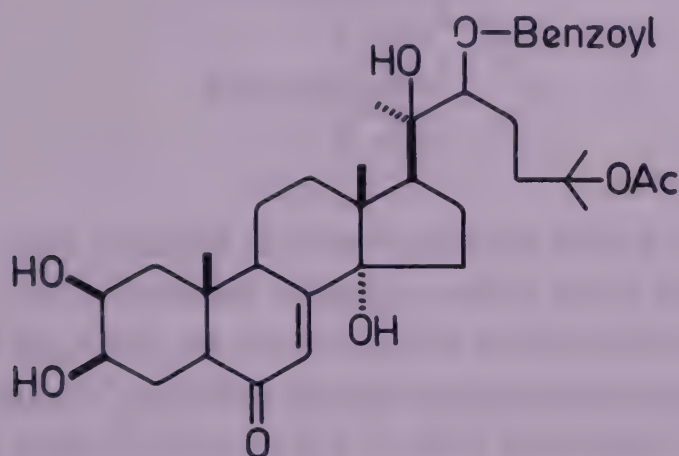
S. cucubalus Wibel; see *S. vulgaris* (Moench) Garcke

S. inflata Smith; see *S. vulgaris* (Moench) Garcke

S. vulgaris (Moench) Garcke syn. *S. cucubalus* Wibel, *S. inflata* Smith, *S. wallichiana* Klotzsch (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 587).

A new phytoecdysteroid - 2-deoxy- α -ecdysone-22-O-benzoate - isolated from aerial parts together with 2-deoxy- α -ecdysone, viticosterone E, 2-deoxyecdysterone, ecdysone and ecdysterone-22-O-benzoate; structure of new compound determined (*Khim. Pri. Soedin.* 1987, 852; *Chem. Abstr.* 1988, 108, 201717 m); another new phytoecdysteroid - viticosterone E-22-O-benzoate - isolated from aerial parts and characterised (*Khim. Pri. Soedin.* 1988, 546; *Chem. Abstr.* 1989, 111, 21092 m).

NEW COMPOUNDS



Viticosterone E-22-O-benzoate

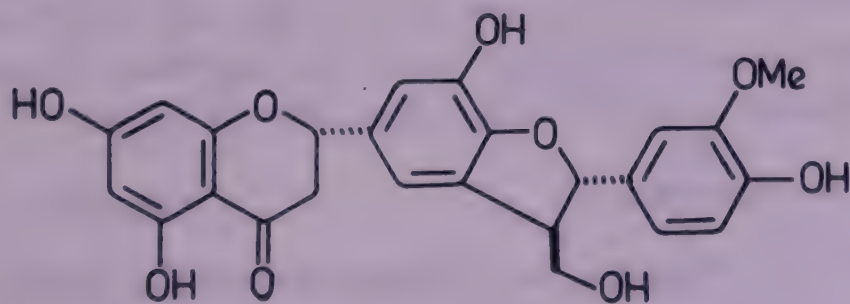
S. wallichiana Klotzsch; see *S. vulgaris* (Moench) Garcke

SILYBUM (Asteraceae)

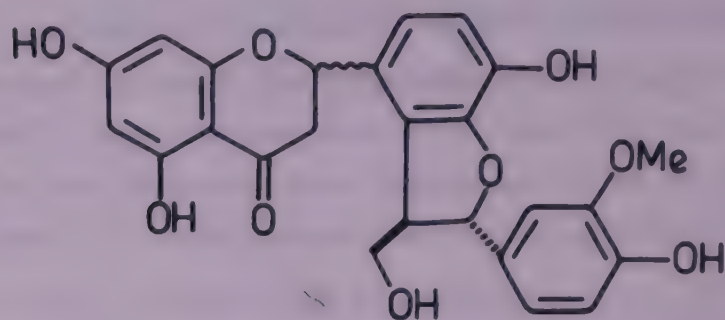
S. marianum (L.) Gaertn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 588).

Three new antihepatotoxic 3-deoxyflavonolignans - silyhermin, neosilyhermin A and neosilyhermin B - isolated and characterised (*Planta Med.* 1984, 50, 310); silybin, silydianin and silychristin isolated from fruits (*Zhongcaoyao* 1985, 16, 46; *Chem. Abstr.* 1985, 102, 225900 t); silybin and silydianin also identified in seeds (*Nanjing Yaoxueyuan Xuebao* 1985, 16, 12; *Chem. Abstr.* 1986, 104, 65958 d); synthesis of silybin (*Chem. Pharm. Bull.* 1985, 33, 1419).

NEW COMPOUNDS



Silyhermin



Neosilyhermin A

~ = β

Neosilyhermin B

~ = α

BIOLOGICAL ACTIVITY

Effect of silybin on human polymorphonuclear leukocyte (PMN) functions studied. Preincubation of PMNs at 37° for 10 min with silybin inhibited, in a dose-dependant manner, luminol enhanced chemiluminescence (CL) generated by stimulated cells without affecting nonenhanced CL or superoxide anion production, indicating a possible anti-inflammatory action of silybin (*Ind. J. Tissue React.* 1988, 10, 223; *Chem. Abstr.* 1989, 111, 17313 n).

SINAPSIS (Brassicaceae)

S. alba L. syn. *Brassica alba* (L.) Rabenh. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 590).

Benzaldehyde isolated as a major component (*Phytochemistry* 1988, 27, 2073).

SINOMENIUM (Menispermaceae)

S. acutum (Thunb.) Rehder & Wils.

Liriodenine isolated from rhizomes (*Chem. Pharm. Bull.* 1988, 36, 2259).

Distribution : Uttar Pradesh.

BIOLOGICAL ACTIVITY

Liriodenine exhibited potent mutagenic activity in *Salmonella typhimurium* strains TA98 and TA100 in presence of liver homogenate (*Chem. Pharm. Bull.* 1988, 36, 2259); sinomenine showed immunosuppressant activity in a variety of *in vivo* and *in vitro* immunity models (*Zhongguo Yaoli Xuebao* 1988, 9, 377; *Chem. Abstr.* 1988, 109, 85934 z).

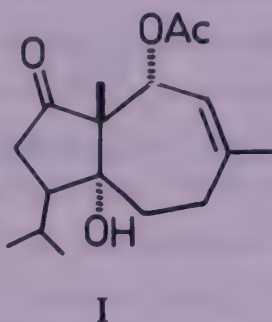
SISYMBRIUM (Brassicaceae)

S. thalianum (L.) Gay & Monnard; see *Arabidopsis thaliana* (L.) Heynh.

SIUM (Apiaceae)

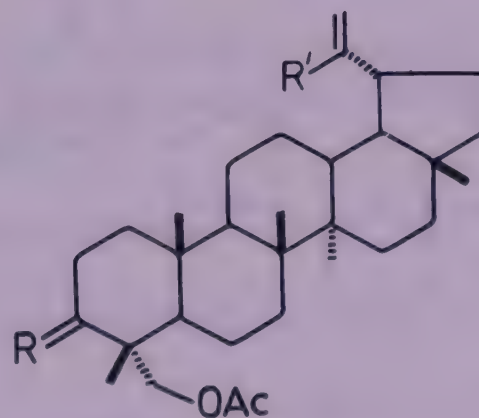
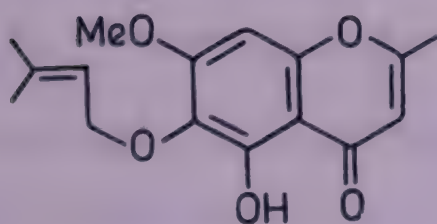
S. latijugum Clarke (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 590).

Isolation and structure elucidation of a new carotene derivative - 1 α -acetoxy-6 α -hydroxy-9-oxo-carot-2-ene (I) - from seeds (*Indian J. Chem.* 1984, 23B, 956).

NEW COMPOUNDS**SKIMMIA (Rutaceae)**

S. laureola (DC.) Sieb. & Zucc. ex Walp. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 590).

A new chromone - skimminin - isolated and characterised along with alloimperatorin, alloisoimperatorin, bergapten, bergaptol, desoxylacarol, 7,8-dimethoxy coumarin, esculetin, 8-geranyloxy psoralen, heraclenin, heraclenol, imperatorin, isoscopoletin, isopimpinellin, isooxypeucedanin, peucenin, its 7-methyl ether, psoralen, scoporone, scopoletin, umbelliferone and β -sitosterol (*Phytochemistry* 1987, 26, 2063); three new lupenes - skimmianone, skimmial and skimmiol - isolated and their structures established (*Phytochemistry* 1988, 27, 1890).

NEW COMPOUNDS

R = O, R' = CHO

Skimmial

R = α -H, β -OAc, R' = CHO

Skimmiol

R = O, R' = CH₂OH

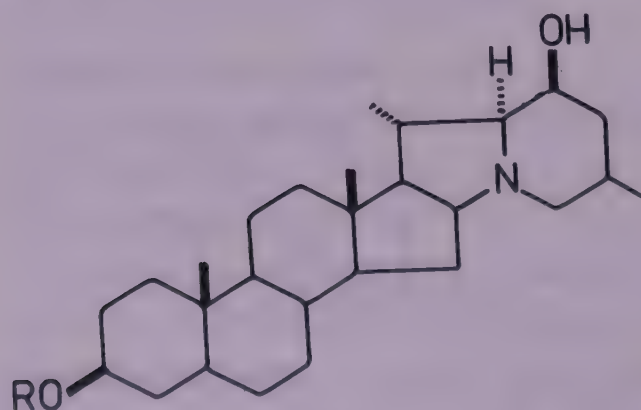
SOJA (Papilionaceae)

S. hispida Moench; see *Glycine max* (L.) Merr.

SOLANUM (Solanaceae)

S. dulcamara L. syn. *S. persicum* Willd. ex R. & S., *S. lyratum* Thunb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 593).

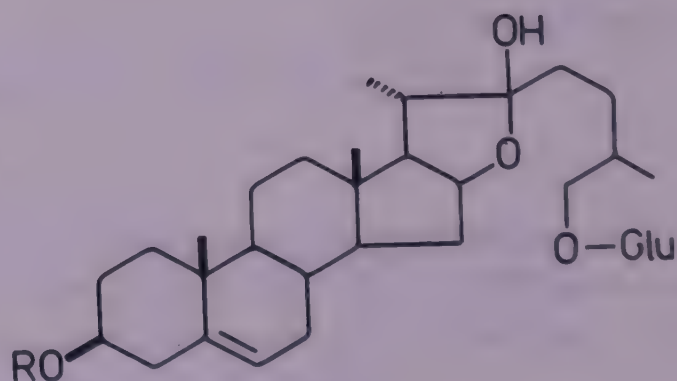
Two new steroidal alkaloid glycosides - β -lycotrioxide and β -lycotetroside - isolated from stems and their structures determined (*Chem. Pharm. Bull.* 1985, 33, 67); solasodine obtained by hydrolysis of glycoalkaloids isolated from leaves of cultivated plant (*Ankara Univ. Eczacilik Fak Derg.* 1985, 15, 91; *Chem. Abstr.* 1987, 106, 210994 k); new furostanol glucuronide (I) isolated from immature berries and characterised as (22 ξ , 25R)3 β , 22, 26-trihydroxyfurost-5-en-3-O- α -rhamnopyranosyl(1 \rightarrow 2)[β -D-glucopyranosyl(1 \rightarrow 3)]- β -D-glucuronopyranosyl-26-O- β -D-glucopyranoside; SL-o, aspidistrin and methyl protoaspidistrin also isolated (*Phytochemistry* 1985, 24, 2748); isolation and characterisation of new steroidal glucuronides - (25R and 25S)spirost-5-ene-3 β -O- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranoside (II and III) and (22 ξ , 25R and 25S)furost-5-ene-22-methoxy-3 β -O- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranosyl-26-O- β -D-glucopyranoside (IV and V) - along with SL-a and tigogenin-3-O- β -D-glucopyranoside from aerial parts (*Planta Med.* 1986, 52, 496); a new glucuronide isolated from aerial parts of Chinese plant and characterised as 22(R)3 β , 16 β , 22, 26-tetrahydroxycholest-5-en-3-O- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-glucuronopyranoside (*Chem. Pharm. Bull.* 1989, 37, 1802).

NEW COMPOUNDS β -Lycotrioxide

R = Gal(4 \rightarrow 1)Glu(2 \rightarrow 1)Glu

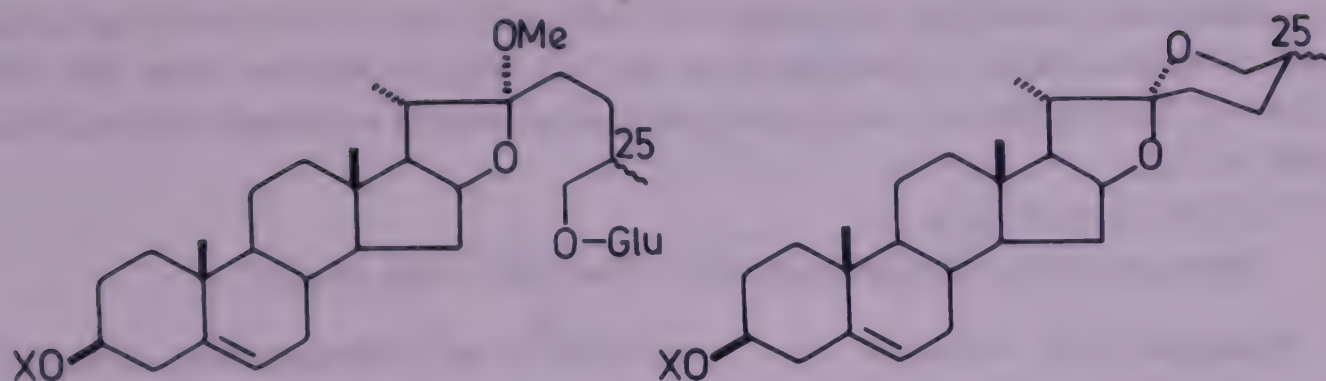
 β -Lycotetroside

R = Gal(4 \rightarrow 1)Glu[(2 \rightarrow 1)Glu](3 \rightarrow 1)Xyl



I

R = Gluc.acid[(2 \rightarrow 1)Rha](3 \rightarrow 1)Glu



X = Gluc.acid(2→1)Rha

II 25(R)

III 25(S)

IV 25(R)

V 25(S)

BIOLOGICAL ACTIVITY

β -Lycotrioside and β -lycotetroside markedly inhibited growth of human cervical cancer cell line JTC-26 (*Chem. Pharm. Bull* 1985, 33, 67).

S. giganteum Jacq. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 593).

Solanogantins isolated from leaves (*Indian J. Pharm. Sci.* 1988, 50, 285).

BIOLOGICAL ACTIVITY

Solanogantins exhibited dose-dependent hypotensive effect in anaesthetised normotensive rats. It also exhibited spasmolytic activity against known spasmogens in isolated smooth muscles (*Indian J. Pharm. Sci.* 1988, 50, 285).

S. hispidum Pers. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 594).

Determination of palmitic (35.3), oleic (28.5), palmitoleic (15.2), stearic (13.3) and 9-hydroxy-cis-12-octadecenoic (isoricinoleic) (3.5%) acids in seed oil (*J. Oil Technol. Assoc. India* 1985, 17, 13; *Chem. Abstr.* 1985, 103, 175465 c).

S. incanum L.; see *S. melongena* L. var. *incanum* (L.) O.Ktze.

S. lycopersicum L.; see *Lycopersicon lycopersicum* (L.) Karsten

S. lyratum Thunb.; see *S. dulcamara* L.

S. melongena L. var. *exculentum* Nees; see *S. melongena* L. var. *melongena*

S. melongena L. var. *incanum* (L.) O.Ktze. syn. *S. incanum* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 596).

Solasodine, solamargine, solasonine and ursolic acid isolated from berries and aerial parts of Formosan plant (*T'ai-wan Yao Hsueh Tsa Chih* 1986, 38, 166; *Chem. Abstr.* 1987, 107, 172434 p); fresh berries of Formosan plant afforded carpesterol and sitosterol (*Planta Med.* 1988, 54, 222).

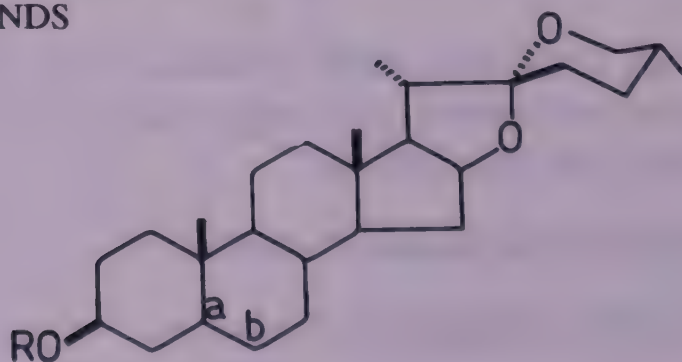
BIOLOGICAL ACTIVITY

Carpesterol showed liver protective effect (*Planta Med.* 1988, 54, 222).

S. melongena L. var. *melongena* syn. *S. melongena* L. var. *esculentum* Nees (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 595).

Steroidal glycosides - melongosides A, B, E, F, G and H - isolated from seeds and their structures determined; melongoside B identified as trillin and melongosides E, F and H identified as 25(R)5 α -spirostan-3-O- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-glucopyranoside, 25(R)spirost-5-en-3-O- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-glucopyranoside and 25(R)spirost-5-en-3-O- β -D-glucopyranosyl(1 \rightarrow 2)- α -L-rhamnopyranosyl(1 \rightarrow 3)- β -D-glucopyranoside respectively (*Khim. Prir. Soedin.* 1984, 610; *Chem. Abstr.* 1985, 102, 92943 k); isolation and structure elucidation of melongoside K from seeds (*Khim. Prir. Soedin.* 1984, 668; *Chem. Abstr.* 1985, 102, 92945 n); two new steroidal saponins - melongoside L and melongoside M - from seeds and their structures established (*Phytochemistry* 1985, 24, 197); isolation of three new saponins - melongosides N, O and P - from seeds and their characterisation (*Phytochemistry* 1985, 24, 1567); 25(R)furost-5-en-3 β ,22 α -,26-triol-26-O- β -D-glucopyranoside: trioside (I) isolated from seeds (*Otkrytiya Izobret.* 1985, 89; *Chem. Abstr.* 1986, 104, 222196 y); solamargine, solasonine, solasodine and a saponin which on acid hydrolysis yielded diosgenin, identified in fruits; β -sitosterol and a mixture of hydrocarbons (C19-35) isolated from unsaponifiable fraction (*Fitoterapia* 1986, 57, 440).

NEW COMPOUNDS



Melongoside A

R = Glu

Melongoside K

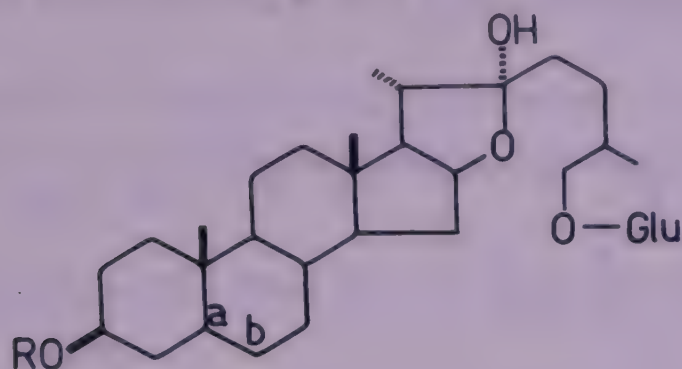
R = Glu[(2 \rightarrow 1)Glu(4 \rightarrow 1)Gal](3 \rightarrow 1)Rha, ab = Δ

Melongoside L

R = Glu[(2 \rightarrow 1)Glu(4 \rightarrow 1)Gal](3 \rightarrow 1)Rha(4 \rightarrow 1)Glu

Melongoside M

R = Glu[(2 \rightarrow 1)Glu(4 \rightarrow 1)Gal](3 \rightarrow 1)Rha(4 \rightarrow 1)Glu, ab = Δ



Melongoside N

R = Glu(2→1)Glu

Melongoside O

R = Glu(2→1)Glu, ab = Δ

Melongoside P

R = Glu[(2→1)Glu](3→1)Rha

I

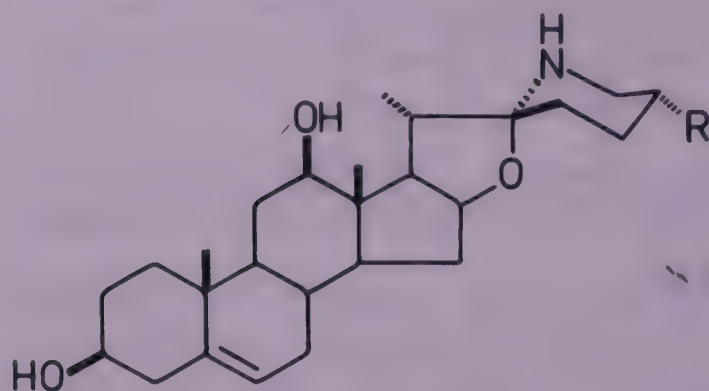
R = Glu[(2→1)Glu](3→1)Rha, ab = Δ

S. nigrum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 596).

Alcoholic extract reduced levels of alkaline phosphatase, SGPT, B.S.P. clearance test values highly significantly, SGOT and thymol turbidity significantly and increased body weight of treated rats significantly. Increase in RNA concentration of liver was significantly more than that of DNA (*J. Res. Ayurveda & Siddha* 1980, 1, 77).

Six new steroidal alkaloids - SN-a, SN-b, SN-c, SN-d, SN-e and SN-f - isolated from immature berries, structures of first five alkaloids determined; solamargine and solasonine also isolated (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1986, 232; *Chem. Abstr.* 1987, 106, 135259 u); isolation of solasodine, 12β-hydroxysolasodine, N-methylsolasodine, solanocapsine, tigogenin and tomatidenol (*Z. Chem.* 1987, 27, 64; *Chem. Abstr.* 1987, 107, 214783 j); a new alkaloid - 23-O-acetyl-12β-hydroxysolasodine - isolated and characterised (*Z. Chem.* 1988, 28, 185; *Chem. Abstr.* 1989, 110, 4639 c); two new quercetin glycosides isolated from leaves and characterised as quercetin-3-O-[galactosylrhamnosyl(1→2)]-β-glucosyl(1→6)-β-galactoside and quercetin-3-O-α-rhamnosyl(1→2)-β-galactoside; quercetin-3-glucosyl(1→6) galactoside, -3-gentiobioside, -3-galactoside and -3-glucoside also isolated (*Phytochemistry* 1989, 28, 1755).

NEW COMPOUNDS



SN-a

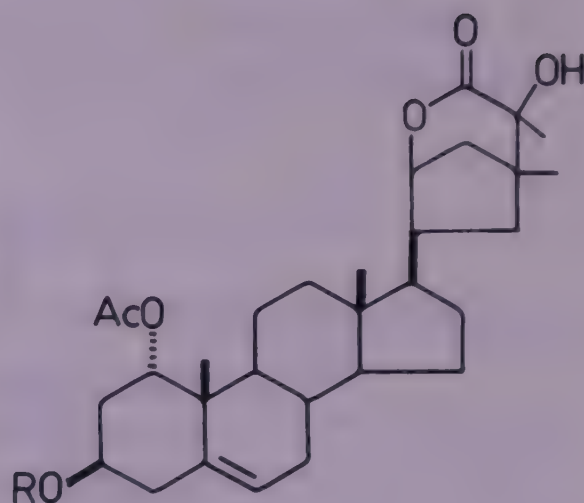
R = Me

SN-b

R = CH₂OH

SN-c

R = COOH



SN-d

R = Glu(6→1)Glu

SN-e

R = Glu[(2→1)Glu](6→1)Glu

S. persicum Willd. ex R. & S.; see *S. dulcamara* L.

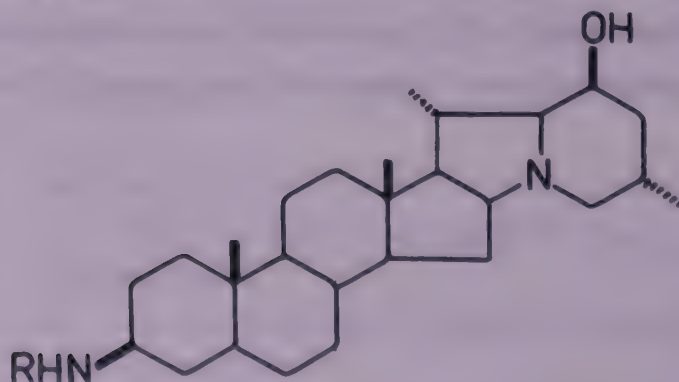
S. pubescens Willd.

Tam. - Choondakkai.

Isolation of 3,7,3'-trimethoxy-5,4',5'-trihydroxyflavone from leaves along with 3,7,3',5'-tetramethoxy-5,4'-dihydroxyflavone and its characterisation (*Phytochemistry* 1984, 23, 2701); a new steroidal alkaloid - solanopubamine - isolated from aerial parts and characterised as 3 β -amino-5 α ,22 α H,25 β H-solanidan-23 β -ol (*Phytochemistry* 1985, 24, 1369); kaempferol-3,4'- and 3,7-dimethyl ethers, kaempferol-3,7,3'-trimethyl ether, myricetin-3,7,3',5'-tetramethyl ether, quercetin-3,3'-dimethyl ether, quercetin-3,7,3'-trimethyl ether and quercetin-3,7,3',4'-tetramethyl ether isolated (*J. Nat. Prod.* 1985, 48, 149); two new steroidal alkaloids - solanopubamides A and B - isolated from aerial parts and their structures determined (*Phytochemistry* 1986, 25, 2003).

Distribution : Deccan Peninsula.

NEW COMPOUNDS



Solanopubamine

R = H

Solanopubamide A

R = CHO

Solanopubamide B

R = Ac

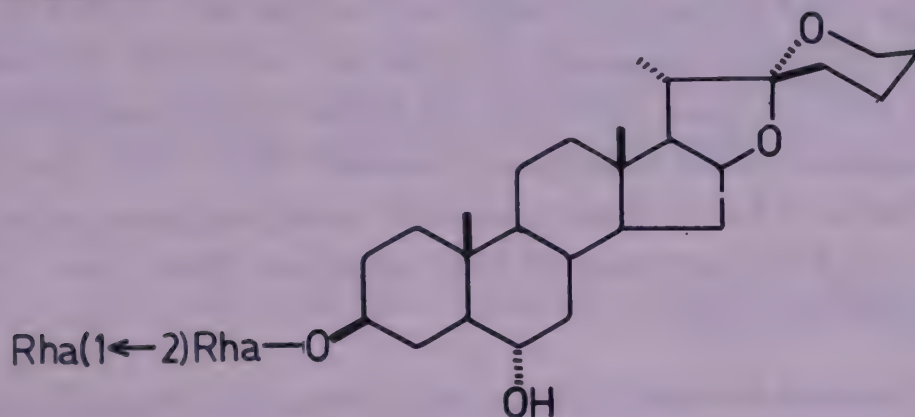
S. spirale Roxb. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 379).

Determination of solasodine in fruits (0.12) and leaves (0.06%) (*Indian Drugs* 1986, 23, 655); tomatidenol, 15 α -hydroxytomatidenol and yamogenin isolated from leaves and etioline from roots (*Planta Med.* 1987, 53, 292).

S. torvum Swartz (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 597).

A new steroidal saponin - torvonin A - isolated from leaves and its structure elucidated (*Phytochemistry* 1985, 24, 2456).

NEW COMPOUNDS

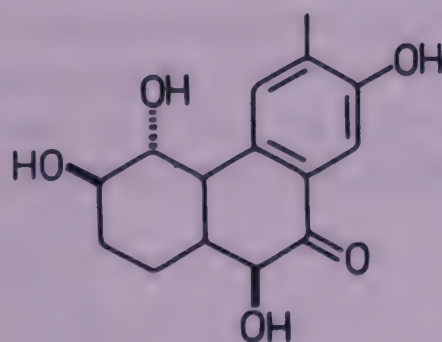


Torvonin A

S. tuberosum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 597).

Synthesis of a phytoalexin - solavetivone (*Bull. Chem. Soc. Jpn.* 1984, 57, 2276); oxylumbin synthesised (*Tetrahedron Lett.* 1985, 26, 3231); a new tricyclic phenolic ketone - solanolone - isolated from potato tubers infected with *Phoma exigua* var. *foveata* and its structure established (*Acta Chem. Scand.* 1986, 40B, 370); a potato tuber-inducing substance isolated from leaves and characterised as 3-oxo-2-(5- β -D-glucopyranosyloxy-2-cis-pentenyl)cyclopentane-1-acetic acid (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1988, 30, 158; *Chem. Abstr.* 1989, 111, 4252 s);

NEW COMPOUNDS



Solanolone

BIOLOGICAL ACTIVITY

3-Oxo-2-(5 β -D-glucopyranosyloxy-2-cis-pentenyl)cyclopentane-1-acetic acid induced tuber formation *in vitro* at <0.01 ppm (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1988, 30, 158; *Chem. Abstr.* 1989, 111, 4252 s).

SOLIDAGO (Asteraceae)

S. canadensis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 598).

Extract of aerial parts showed hypoazotemic and diuretic activities in rabbits (*Rastit. Resur.* 1988, 24, 92; *Chem. Abstr.* 1988, 108, 201741 q).

Kaempferol, its 3-O- β -D-glucorhamnoside, isorhamnetin, its 3-O- β -D-glucorhamnoside, rhamnetin-3-O- β -D-glucorhamnoside, quercetin and its 3-O- β -D-rutinoside isolated (*Khim. Prir. Soedin.* 1985, 566; *Chem. Abstr.* 1986, 104, 165306 h); a novel saponin isolated from aerial parts and its genin identified as bayogenin (*Pharmazie* 1987, 42, 622; *Chem. Abstr.* 1988, 108, 183623 w); isolation of 3-O-(D-glucopyranosyl-6''-acetyl)-isorhamnetin and -quercetin and isorhamnetin 3-O- β -D-glucopyranoside from aerial parts (*Rastit. Resur.* 1988, 24, 92; *Chem. Abstr.* 1988, 108, 201741 q).

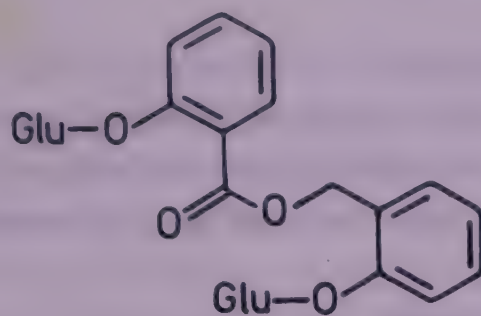
S. nemoralis Ait. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 599).

Four kaurane diterpenoids - (-)kaur-16-en-19-oic acid, (-)15 α -hydroxykaur-16-en-19-oic acid, (-)kauran-16 β -ol and (-)17-hydroxykaur-15-en-19-oic acid - isolated from leaves (*J. Nat. Prod.* 1987, 50, 327).

S. virgaurea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 599).

Leiocarposide isolated (*Pharmazie* 1984, 39, 869; *Chem. Abstr.* 1985, 102, 125230 f); kaempferol, isorhamnetin, rhamnetin and their 3-O- β -D-glucorhamnosides, quercetin and its 3-O- β -D-rutinoside isolated (*Khim. Prir. Soedin.* 1985, 566; *Chem. Abstr.* 1986, 104, 165306 h); a new bisdesmosidic phenol glycoside - virgaureoside A - isolated from aerial parts and its structure determined (*Pharmazie* 1985, 40, 795; *Chem. Abstr.* 1987, 106, 9251 x); a complex mixture of triterpenoid glycosides yielded virgaureasaponins 1, 2 and 3 on alkaline hydrolysis; virgaureasaponin 1 characterised as 28-O- α -L-rhamnopyranosyl(1 \rightarrow 3)- β -D-xylopyranosyl(1 \rightarrow 4)- α -L-rhamnopyranosyl-(1 \rightarrow 2)- β -D-fucopyranoside of 3-O- β -D-glucopyranosyl-polygalacic acid (*Pharmazie* 1987, 42, 541; *Chem. Abstr.* 1988, 108, 52789 g).

NEW COMPOUNDS



Virgaureoside A

BIOLOGICAL ACTIVITY

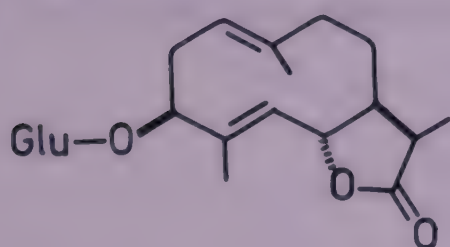
Leiocarposide at 0.1 g/kg dose showed antiphlogistic and analgesic activities in rat models for inflammation and pain (*Pharmazie* 1984, 39, 869; *Chem. Abstr.* 1985, 102, 125230 f); virgaureasaponin 1 inhibited growth of *Candida albicans* (*Pharmazie* 1987, 42, 140; *Chem. Abstr.* 1987, 107, 28257 r; *Pharmazie* 1987, 42, 541; *Chem. Abstr.* 1988, 108, 52789 g).

SONCHUS (Asteraceae)

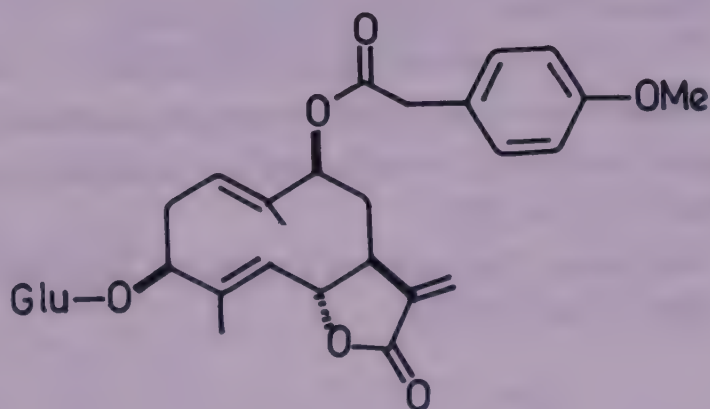
S. oleraceus L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 601).

Isolation and structure elucidation of four new sesquiterpene glycosides - sonchusides A, B, C and D; glucozaluzanin C, macroclinside A, crepidiaside A and picrisides B and C also isolated (*Chem. Pharm. Bull.* 1987, 35, 2869).

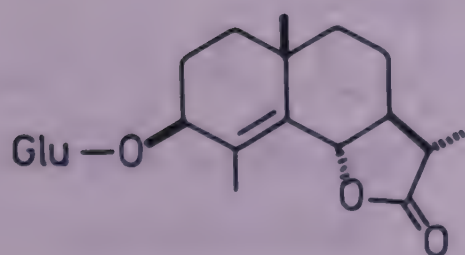
NEW COMPOUNDS



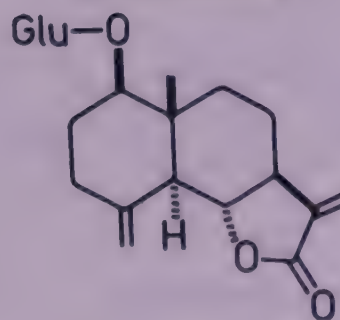
Sonchuside A



Sonchuside B



Sonchuside C



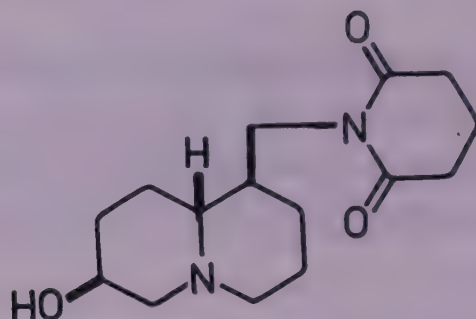
Sonchuside D

SOPHORA (Papilionaceae)

S. glauca DC. syn. *S. velutina* Lindl.

Isolation and structure determination of (+)9 β -hydroxylamprolobine from leaves; (+)lamprolobine and cytisine also isolated (*J. Nat. Prod.* 1986, 49, 117); alangidiol, epilupeol, lupeol and mammanine isolated from roots and stems (*Zhongyao Tongbao* 1987, 12, 611; *Chem. Abstr.* 1988, 108, 72144 w).

Distribution : Hills of peninsular India.

NEW COMPOUNDS

(+)9 β -Hydroxylamprolobine

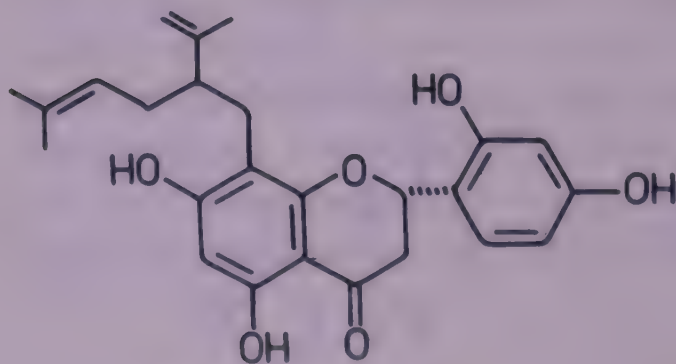
S. mollis (Royle) Baker (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 601).

Optically-active sparteine synthesised (*Jpn.* 6,001,183 (1985) Jan. 07; *Chem., Abstr.* 1985, 103, 88120 t).

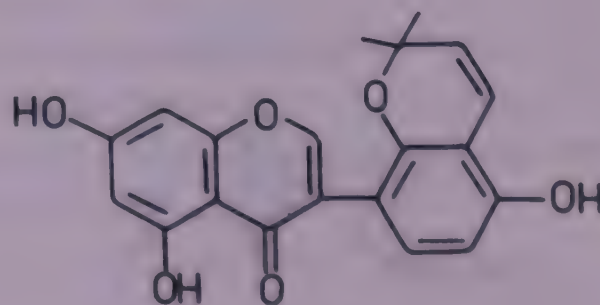
S. moorcroftiana (Benth.) Benth. ex Baker

A new flavanone - sophoraflavanone G - and an isoflavone - sophoraisoflavone A - isolated from roots and their structures established; sophoraflavanone B (6-isopentenylnarigenin), calycosin, licoisoflavone B, (-)maackiain and medicagol also isolated (*Chem. Pharm. Bull.* 1988, 36, 2220).

Distribution : Kashmir and Ladakh, alt. 3000-3600 m.

NEW COMPOUNDS

Sophoraflavanone G

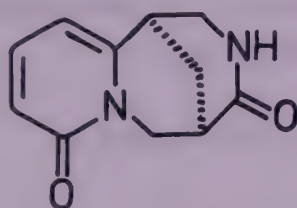


Sophoraisoflavone A

S. secundiflora Lag. ex DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 601).

Apigenin, its 7-O-glucoside, kaempferol, its 3-O-rhamnoside and 3-O-rhamnoglucoside, quercetin and rutin isolated from leaves (*Fitoterapia* 1984, 55, 105); leaves of Egyptian plant afforded sparteine and 13-hydroxysparteine (*Bull. Pharm. Sci., Assiut Univ.* 1985, 8, 99; *Chem. Abstr.* 1986, 104, 126540 k); a new lupine alkaloid - (+)11-oxocytisine - isolated from leaves and its structure determined; (-)anagyrine, (-)baptifoline, (-)cytisine, (-)N-acetylcytisine, (-)N-formylcytisine and (-)N-methylcytisine also isolated (*Phytochemistry* 1986, 25, 2000); identification of argentine, cytisine, N-methylcytisine and lupinine in leaves of Egyptian plant (*Bull. Pharm. Sci., Assiut Univ.* 1987, 10, 47; *Chem. Abstr.* 1989, 110, 54490 t); fisetin, kaempferol, 5-deoxykaempferol, quercetin and 3-methoxyquercetin obtained from leaves (*Fitoterapia* 1987, 58, 284).

NEW COMPOUNDS

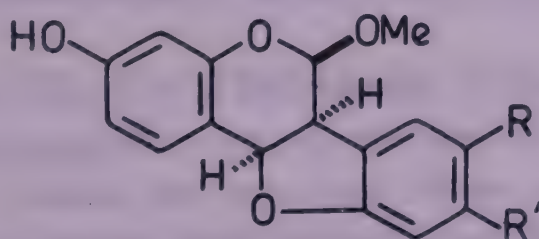


(+)11-Oxocytisine

S. tomentosa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 601).

Two new pterocarpan - sophoracarpan A and B - isolated and their structures determined (*Chem. Pharm. Bull.* 1986, 34, 3067); synthesis of maackiain (*Chem. Commun.* 1988, 374).

NEW COMPOUNDS



Sophoracarpan A

R = H, R' = OMe

Sophoracarpan B

R R' = -OCH₂O-

S. velutina Lindl.; see *S. glauca* DC.

SORBUS (Rosaceae)

S. aucuparia L. syn. *Pyrus aucuparia* Gaertn. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 640).

Dihydrosinapic aldehyde (3-(4-hydroxy-3,5-dimethoxyphenyl)-propanal) (0.0002%) isolated from sapwood (*Phytochemistry* 1989, 28, 1548).

SORGHUM (Poaceae)

S. bicolor (L.) Moench syn. *S. vulgare* (L.) Pers., *Andropogon sorghum* Brot. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 602).

(Z)3-Hexen-1-ol acetate (65.0), (Z)3-hexen-1-ol (14.0), hexanal (5.2), m-xylene (4.7), toluene (3.9), nonanal (3.8), o-xylene (2.0) and decanal (1.4%) determined in four week old seedlings (*J. Nat. Prod.* 1987, 50, 950); isolation and synthesis of a germination stimulant - 5-methoxy-3-[(8'Z,11'Z)pentadeca-8',11',14'-trienyl]-benzene-1,2,4-triol - for seeds of *Striga asiatica* (*J. Chem. Soc. Perkin 1* 1989, 1171).

S. vulgare (L.) Pers.; see *S. bicolor* (L.) Moench

SOULIEA (Ranunculaceae)

S. vaginata (Maxim.) Franch. syn. *Coptis ospricarpa* Bruhl

9,19-Cyclolanostanol xylosides - beesiosides III and IV - isolated from rhizomes (*Phytochemistry* 1985, 24, 1329).

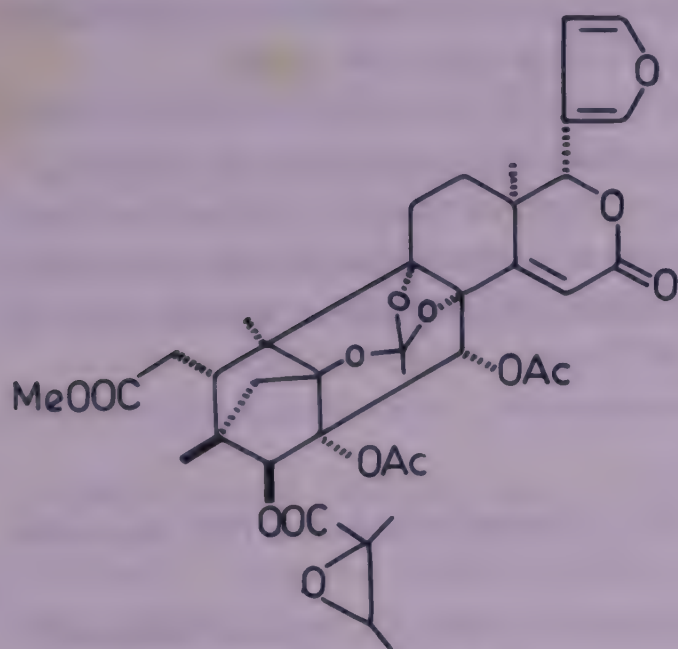
Distribution : Sikkim and Bhutan, alt. 2800-4000 m.

SOYMIDA (Meliaceae)

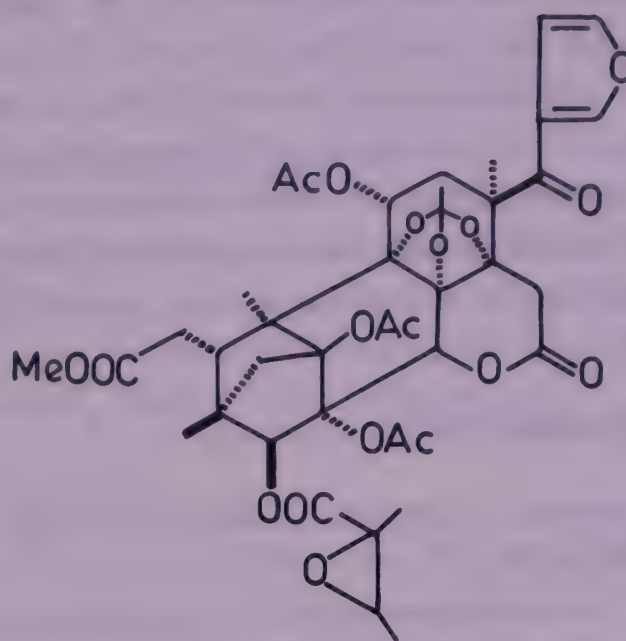
S. febrifuga A. Juss. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 603).

Three new tetranortriterpenoids - epoxyfebrinin B, 14,15-dihydroepoxy febrinin B and febrinolide - isolated from fruits and their structures elucidated; deoxyandirobin, 17 β -hydroxy-6 α -acetoxyazadiradione, methyl angolensate and sitosterol also isolated (*Phytochemistry* 1985, 24, 305); seed oil showed presence of linoleic, linolenic, oleic, palmitic and stearic acids, lupeol and sitosterol (*Natl. Acad. Sci. Lett.* 1987, 10, 195).

NEW COMPOUNDS



Epoxyfebrinin B



Febrinolide

SPARGANIUM (Sparganiaceae)

S. erectum L. ssp. *stoloniferum* (Graebn) Hara syn. *S. ramosum* sensu Hook.f. (non Huds.) p.p., *S. stoloniferum* Buch.-Ham.

Eng. - Common burreed.

Hexadecanoic acid (32.7), phenethyl alcohol (11.7) and hydroquinone 11.5%) determined in root essential oil (0.34%) by GC-MS (Yaowu Fenxi Zazhi 1988, 8, 270; Chem. Abstr. 1989, 110, 54493 w).

Distribution : Kashmir, Punjab and Uttar Pradesh, ascending to 1600 m in hills.

S. ramosum Huds.; see *S. erectum* L. ssp. *stoloniferum* (Graebn) Hara

S. stoloniferum Buch.-Ham.; see *S. erectum* L. ssp. *stoloniferum* (Graebn) Hara

SPATHODEA (Bignoniaceae)

S. campanulata Beauv. (Compend. Indian Med. Plants, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 641).

3 β -Acetoxyoleanolic acid, 3 β -acetoxy-12-hydroxyoleanan-28,13-olide, oleanolic acid and siaresinolic acid isolated from stem bark (Planta Med. 1988, 54, 476).

SPERMACOCE (Rubiaceae)

S. stricta L.f.; see *Borreria pusilla* (Wall.) DC.

SPERMADICTION (Rubiaceae)

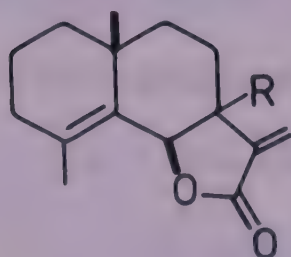
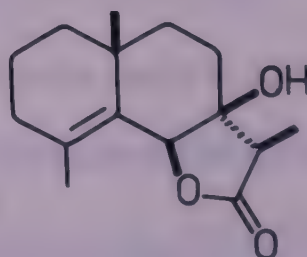
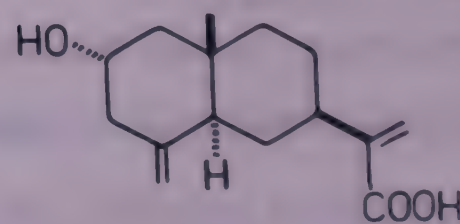
S. suaveolens Roxb. var. *suaveolens* syn. *Hamiltonia suaveolens* sensu Hook.f., p.p. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 130).

Alcoholic extract of root (0.5 g/kg, p.o. and 0.4 g/kg, p.o.) caused 45% reduction in blood sugar in normal rats and 37% reduction in alloxanised rats respectively at the end of 5th hr. Similar reduction was observed in normal rabbits, dogs and monkeys. Ethyl acetate-soluble fraction of alcoholic extract at 1/10th of above dose showed hypoglycaemic activity of similar magnitude in normal rats but was inactive in alloxanised rats (*Indian J. Med. Res.* 1985, 81, 86).

SPHAERANTHUS (Asteraceae)

S. indicus L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 384).

A new eudesmenolide - 7 α -hydroxyeudesm-4-en-6,12-olide (I) (7-hydroxyfrullanolide) - isolated from flowers and its structure determined (*Indian J. Chem.* 1986, 25B, 233; *J. Chem. Soc. Perkin 1* 1988, 157; *J. Chem. Res., Synop.* 1989, 68; *Chem. Abstr.* 1989, 111, 130706 f); its isomer - 7 β -hydroxyeudesm-4-en-6,12-olide (II) - and a new dihydrolactone (III) also isolated and characterised (*Indian J. Chem.* 1986, 25B, 233); isolation of a new sesquiterpene acid - 2-hydroxycostic acid - and its structure elucidation; β -eudesmol and ilicic acid also isolated (*J. Chem. Soc. Perkin 1* 1988, 157); isolation of an anthelmintic agent - 24(S)24-ethylcholesta-5,22-dien-3 β -O- β -D-glucoside (*Indian Drugs* 1989, 26, 317).

NEW COMPOUNDS**I**R = α -OH**II**R = β -OH**III****2-Hydroxycostic acid****BIOLOGICAL ACTIVITY**

7 α -Hydroxyeudesm-4-en-6,12-olide exhibited antimicrobial activity (*J. Chem. Res., Synop.* 1989, 68; *Chem. Abstr.* 1989, 111, 130706 f).

SPILANTHES (Asteraceae)

S. acmella (L.) Murr.; see *S. calva* DC.

S. acmella (L.) Murr. var. *paniculata* (DC.) Clarke; see *S. paniculata* DC.

S. calva DC. syn. *S. acmella* auct. [non (L.) Murr.] (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 642).

A new triterpenoid saponin isolated from roots and characterised as olean-12-en-3-O- β -D-galactopyranosyl(1 \rightarrow 4)- α -L-rhamnopyranoside (*Indian J. Chem.* 1987, 26B, 87).

S. ocymifolia (Lamk.) A.H. Moore; see *S. radicans* Jacq.

S. oleracea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 605).

New amides - (Z)non-2-en-6,8-diynoic acid isobutylamide, (Z)dec-2-en-6,8-diynoic acid isobutylamide and 2,6,8-decatrienoic acid 2-methylbutylamide - isolated and characterised; spilanthol (2,6,8-decatrienoic isobutylamide) also isolated (*Monatsh. Chem.* 1985, 116, 273; *Chem. Abstr.* 1985, 102, 218346 p).

S. paniculata DC. syn. *S. acmella* auct. [non (L.) Murr.] var. *paniculata* (DC.) Clarke

Alanine (3.2), lysine (2.75), threonine (2.4), methionine (1.68), leucine (1.54), valine (1.52), proline (1.33), hydroxyproline (1.31), tyrosine (1.30), histidine (0.5), glutamic acid (0.39) and glycine (0.03%) determined in aerial parts (*J. Indian Chem. Soc.* 1987, 64, 376); determination of palmitic (55.5) and stearic (13.5%) acids in aerial parts (*J. Indian Chem. Soc.* 1988, 65, 146); isolation of sitosterol, its glucoside, stigmasterol, stearic acid and tetratriacontanoic acid from aerial parts (*J. Indian Chem. Soc.* 1988, 65, 525).

Distribution : Meghalaya, Sikkim and Western Ghats, alt. 100-1500 m.

S. radicans Jacq. syn. *S. ocymifolia* (Lamk.) A.H. Moore

Isolation of N-2-phenylethylcinnamamide from leaves along with lupeyl acetate, stigmasterol and taraxasteryl acetate and its characterisation (*Phytochemistry* 1984, 23, 2671).

Distribution : Kerala.

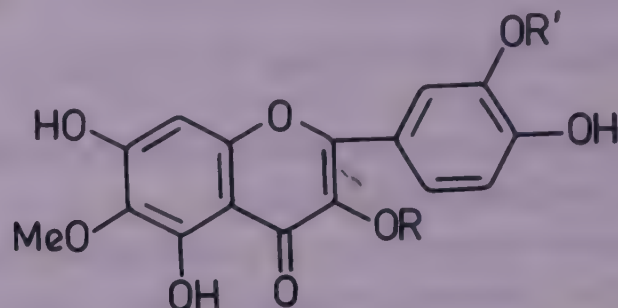
SPINACIA (Chenopodiaceae)

S. oleracea L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 605).

Three new flavonol glycosides isolated from leaves and characterised as patuletin-3-O- β -D-glucopyranosyl(1 \rightarrow 6)[β -D-apiofuranosyl(1 \rightarrow 2)]- β -D-glucopyranoside (I), patuletin-3-O-

β -gentiobioside (II) and spinacetin-3-O- β -gentiobioside (III); 3,6-dimethoxy-5,7,3',4'-tetrahydroxyflavone-4'-O- β -D-glucuronide also obtained (*Phytochemistry* 1986, 25, 231).

NEW COMPOUNDS



I

R = Glu[(2→1)Apiose](6→1)Glu, R' = H

II

R = Glu(6→1)Glu, R' = H

III.

R = Glu(6→1)Glu, R' = Me

SPONDIAS (Anacardiaceae)

S. axillaris Roxb.; see *Choerospondias axillaris* (Roxb.) Burt & Hill

STACHYS (Lamiaceae)

S. palustris L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 643).

Stachynone (1-isopropyl-4,7-dimethylbicyclo[4.4.0]-10-decaene-6-one) and 1-isopropyl-4,7-dimethylbicyclo[4.4.0]-6,10-decadiene identified in essential oil by PC (*J. Chromatogr.* 1985, 333, 288).

S. sylvatica L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 643).

Stachynone and 1-isopropyl-4,7-dimethylbicyclo[4.4.0]-6,10-decadiene identified in essential oil by PC (*J. Chromatogr.* 1985, 333, 288).

STACHYTARPHETA (Verbenaceae)

S. dichotoma Vahl

Isolation of ipolamiide from aerial parts (*Bull. Soc. Chim. Belg.* 1987, 96, 633; *Chem. Abstr.* 1988, 109, 3764 g).

Distribution : Meghalaya.

S. indica Vahl; see *S. jamaicensis* (L.) Vahl

S. jamaicensis (L.) Vahl syn. *S. jamaicensis* (L.) Vahl var. *indica* H.J. Lam., *S. indica* auct. (non Vahl) p.p. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 606).

Structure of tarphetalin revised and found to be identical to that of ipolamiide (*Phytochemistry* 1984, 23, 907).

S. jamaicensis (L.) Vahl var. *indica* H.J. Lam.; see *S. jamaicensis* (L.) Vahl

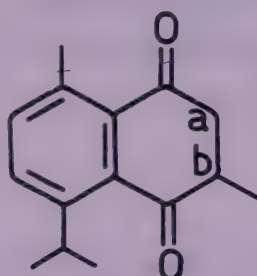
STAHLIANTHUS (Zingiberaceae)

S. involucratus (King ex Baker) Craib

Isolation and structure elucidation of stahlianthusone and dihydrostahlianthusone from bulb essential oil; aromadendrene, cadinene, trans-caryophyllene, α -copaene and γ -muurolene also isolated (*Sepu* 1984, 1, 35; *Chem. Abstr.* 1985, 103, 27052 a).

Distribution : Eastern Himalayas and Meghalaya.

NEW COMPOUNDS



Stahlianthusone

ab = Δ

Dihydrostahlianthusone

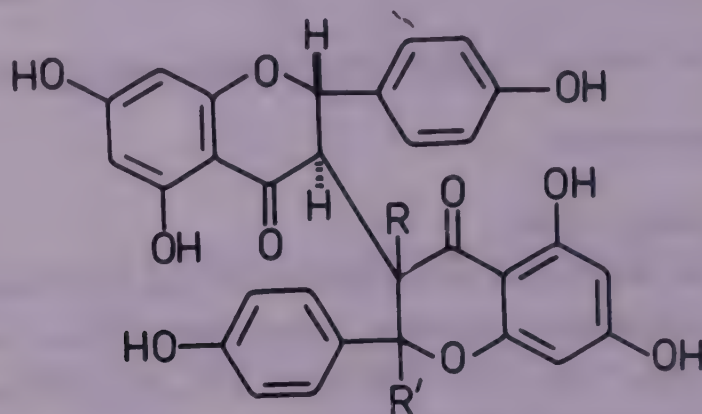
STELLERA (Thymelaeaceae)

S. chamaejasme L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 606).

A new C-3/C-3'' biflavanone - isochamaejasmine - isolated and its structure established (*Chem. Lett.* 1984, 1587; *Chem. Abstr.* 1985, 102, 21154 t; *Chem. Pharm. Bull.* 1986, 34, 3249); chamaejasmine also isolated from roots and characterised (*Chem. Pharm. Bull.* 1986, 34, 3249); isolation of daphnetin, daphnoretin, scopoletin and umbelliferone (*Khim. Pri. Soedin.* 1985, 709; *Chem. Abstr.* 1986, 104, 85435 j); methyl 7,10-octadecadienoate, 3,7,11-trimethyl-1-dodecanol-2,6,10-triene, 1-phenylpropane-1,2-dione, cinnamyl alcohol, n-octane, 2,6-dimethyloctane, 2,6-dimethylheptane, 5-methyldecane, n-tridecane, n-dodecane, 2,5-dimethyldodecane and 1-phenyl-3-ketohexane isolated (*Zhongyao Tongbao* 1985, 10, 559; *Chem.*

Abstr. 1986, 104, 145515 x); huratoxin, liriorelinol B, pinorelinol, pimelea factor P2, simplexin and subtoxin A isolated from fraction of root extract having piscicidal activity, whereas chamaejasmenin B, chamaejasmenin C, matairesinol and eight C-3/C-3''-biflavones obtained from fraction exhibiting no piscicidal activity (*Tennen Yuki Kagobutsu Toronkai Koen Yoshishu* 1985, 27, 734; *Chem. Abstr.* 1986, 104, 213078 j).

NEW COMPOUNDS



Chamaejasmine

$R = \alpha\text{-H}$, $R' = \beta\text{-H}$

Isochamaejasmine

$R = \beta\text{-H}$, $R' = \alpha\text{-H}$

STENOLOBIMUM (Bignoniaceae)

S. stans (L.) D.Don; see *Tecoma stans* (L.) Juss. ex H.B. & K.

STEPHANIA (Menispermaceae)

S. elegans Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 608).

Isotetrandrine synthesised (*Khim. Prir. Soedin.* 1985, 86; *Chem. Abstr.* 1985, 103, 71570 s); synthesis of sinoacutine (salutaridine) (*Angew. Chem.* 1986, 98, 1032; *Chem. Abstr.* 1987, 106, 18900 k); tetrahydropalmatine synthesised (*J. Chem. Soc. Perkin 1* 1986, 781).

S. glabra (Roxb.) Miers syn. *S. rotunda* sensu Hook.f. & Thoms. p.p. (non Lour.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 609).

Capaurine, corydalmine, dehydrocorydalmine, corynoxidine, jatrorrhizine, stepharanine, stepholidine, palmatine and tetrahydropalmatine isolated from rhizomes (*J. Indian Chem. Soc.* 1984, 61, 1016); isolation of cepharamine and (-)-tetrahydropalmatine from leaves and stems (*J. Nat. Prod.* 1985, 48, 341).

BIOLOGICAL ACTIVITY

Intravenous administration of (-)-stepholidine lowered blood pressure in anaesthetised dogs and rats, hypotension was antagonised by phentolamine or yohimbine. In reserpinised animal, (-) stepholidine increased blood pressure. At large dose (5.50 mg/kg, i.v.) it inhibited pressor response to noradrenaline or clonidine and reversed adrenaline-induced pressor response. At large doses it blocked postsynaptic α -adrenoceptors (*Zhongguo Yaoli Xuebao* 1987, 8, 497; *Chem. Abstr.* 1988, 108, 424 q).

S. gracilentia Miers

Isolation of sinoacutine, isosinoacutine, magnoflorine and papaverine from roots (*Indian J. Nat. Prod.* 1987, 3(1), 8; *Chem. Abstr.* 1988, 108, 109565 n).

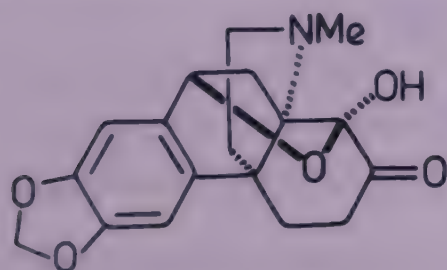
Distribution : Himalayas, from Kumaon to Nepal, alt. 2100-2400 m.

S. hermandifolia (Willd.) Walp.; see *S. japonica* (Thunb.) Miers

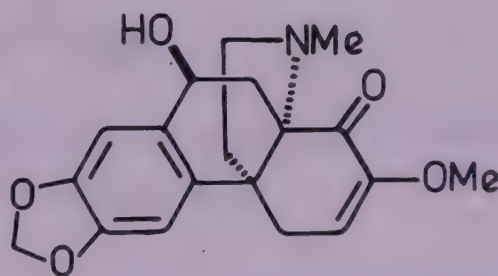
S. japonica (Thunb.) Miers syn. *S. hermandifolia* (Willd.) Walp. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 646).

Two new hasubanan alkaloids - stephanaberrine and prostephanaberrine - isolated from fruits and their structures established (*J. Nat. Prod.* 1986, 49, 588).

NEW COMPOUNDS



Stephanaberrine



Prostephanaberrine

S. rotunda Lour.; see *S. glabra* (Roxb.) Miers

STEPHEGYNE (Rubiaceae)

S. parvifolia (Roxb.) Korth.; see *Mitragyna parvifolia* (Roxb.) Korth.

STERCULIA (Sterculiaceae)

S. foetida L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 609).

Luteolin-7-O- β -D-galactopyranosyl(1 \rightarrow 4)- α -L-arabinopyranoside isolated from roots (*Natl. Acad. Sci. Lett.* 1986, 9, 169).

S. fulgens Wall. ex Mast.; see *Firmiana fulgens* (Wall. ex Mast.) Corner

S. pallens Wall. ex King; see *Firmiana fulgens* (Wall. ex Mast.) Corner

S. scaphigera Wall. ex G.Don; see *Scaphium scaphigerum* (Wall. ex G.Don) Guibourt

S. urens Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 234).

Stercurensin isolated from leaves and characterised as 2',4'-dihydroxy-6'-methoxy-3'-methylchalcone (*Indian J. Chem.* 1984, 23B, 1010).

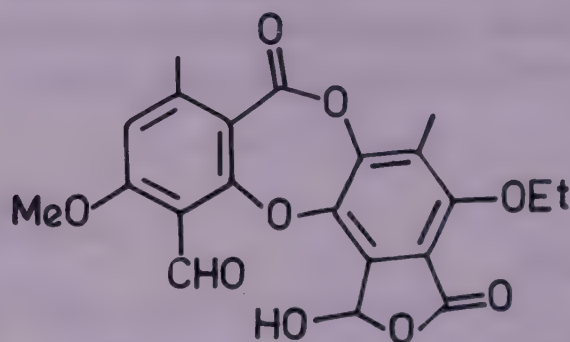
STEREOCAULON (Stereocaulaceae)

S. alpinum (Th. Fr.) Laur. ex Funck

Methyl β -orsellinate and atranorin isolated; former previously wrongly identified as 4,6-dihydroxy-2-methoxy-3-methylacetophenone (*Phytochemistry* 1985, 24, 127); isolation and structure elucidation of vesuvianic acid (*Phytochemistry* 1986, 25, 550).

Distribution : Himalayas, alt. 2400-4400 m.

NEW COMPOUNDS



Vesuvianic acid

STEREOSPERMUM (Bignoniaceae)

S. chelonoides (L.f.) DC. syn. *S. suaveolens* (Roxb.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 610).

6-O-Glucosylscutellarein isolated as minor component along with stereolensin (6-O- β -D-glucosylluteolin) from leaves (*J. Indian Chem. Soc.* 1988, 65, 150).

S. suaveolens (Roxb.) DC.; see *S. chelonoides* (L.f.) DC.

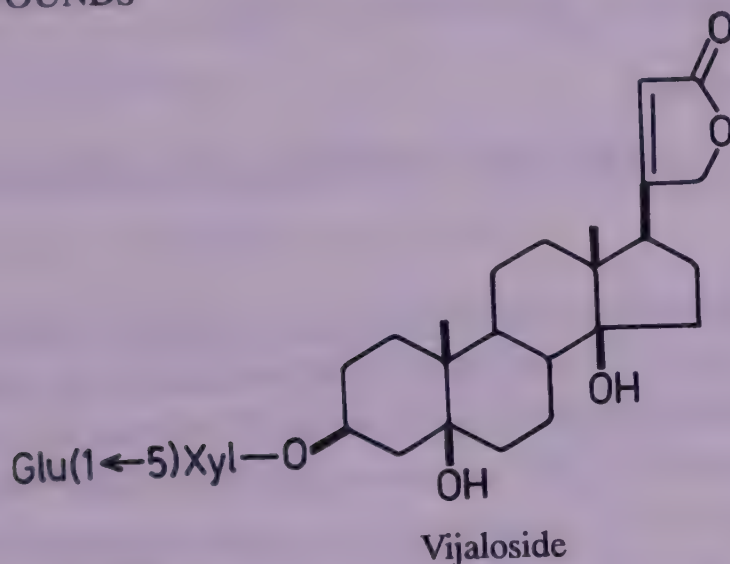
S. xylocarpum Benth. & Hook.f.; see *Radermachera xylocarpa* (Roxb.) K.Schum.

STREBLUS (Moraceae)

S. asper Lour. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 611).

A new saponin isolated from roots and characterised as β -sitosterol-3-O- β -D-arabinofuranosyl-O- α -L-rhamnopyranosyl-O- β -D-glucopyranoside (*Acta Cienc. Indica, Chem.* 1984, 10, 122; *Chem. Abstr.* 1985, 103, 119969 h); isolation of lupanol-3-O- β -D-glucopyranosyl (1 \rightarrow 5)-O- β -D-xylofuranoside from roots and its structure determination (*Indian J. Chem.* 1985, 24B, 562); stem bark afforded mansonin and strebloside (*J. Nat. Prod.* 1985, 48, 981); a new cardiac glycoside - vijaloside - isolated from roots and characterised as periplogenin-3-O- β -D-glucopyranosyl(1 \rightarrow 5)-O- β -D-xylofuranoside; asperoside also isolated (*Planta Med.* 1985, 51, 343).

NEW COMPOUNDS



BIOLOGICAL ACTIVITY

Strebloside and mansonin showed significant activity in KB cell culture system with ED₅₀ values of 0.035 and 0.042 μ g/ml respectively (*J. Nat. Prod.* 1985, 48, 981).

STRIGA (Scrophulariaceae)

S. asiatica (L.) Kuntze var. *asiatica* syn. *S. lutea* sensu Hook.f., p.p. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 235).

Luteolin-3',4'-dimethyl ether, luteolin 7,3',4'-trimethyl ether, acacetin, its 7-methyl ether, apigenin and chrysoeriol isolated (*J. Nat. Prod.* 1985, 48, 491).

S. lutea Hook.f.; see *S. asiatica* (L.) Kuntze var. *asiatica*

STROBILANTHES (Acanthaceae)

S. auriculatus Nees (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 235).

Isoborneol, isoborneol isobutyrate, 8-(isobutyryloxy)isoborneol, (-)-6-hydroxyisobornyl isobutyrate, 8-(isobutyryloxy)isobornyl isobutyrate, (-)-8-hydroxyisobornyl isobutyrate, 5-

hydroxyisobornyl isobutyrate and 5-oxoisobornyl isobutyrate isolated from essential oil (*Ann. Chem.* 1987, 21).

S. cusia (Nees) Imlay syn. *S. flaccidifolius* Nees (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 611).

Betulin, lupeol, lupenone and β -sitosterol isolated from roots (*Zhongcaoyao* 1987, 18, 488; *Chem. Abstr.* 1988, 108, 101194 v).

S. flaccidifolius Nees; see *S. cusia* (Nees) Imlay

S. heyneanus Nees; see *Nilgiranthus heyneanus* (Nees) Bremek.

STROPHANTHUS (Apocynaceae)

S. gratus Franch. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 612).

BIOLOGICAL ACTIVITY

Ouabain (1.0 μ M), dihydroouabain (50.0 μ M) and strophanthidin (1.0 μ M) exerted both inhibitory and stimulatory effects on Ca^{2+} current in frog ventricular cells. The stimulatory effect may contribute to positive inotropic effect of these glycosides (*Pfluegers Arch.* 1986, 406, 340; *Chem. Abstr.* 1986, 104, 179912 q); effect of ouabain on proximal tubular transport in dogs studied; intrarenal infusion of ouabain (0.12 μ M/kg) into volume-expanded ethacrynic acid-infused dogs reduced lactate, phosphate, sodium chloride and water reabsorption, but had no effect on bicarbonate reabsorption (*Dev. Nephrol.* 1987, 18, 82; *Chem. Abstr.* 1987, 107, 126746 u).

Ouabain and related cardiac glycosides increased phospholipase C activity 5-fold in rat pinealocytes, apparently through a mechanism involving inhibition of Na^+ , K^+ -ATPases and accumulation of intracellular Na^+ and Ca^{2+} , not involving α 1-adrenoceptors (*Biochem. Biophys. Res. Commun.* 1987, 142, 819; *Chem. Abstr.* 1987, 106, 131471 j); ouabain (1.0 mM) caused rapid contraction of aortic strips with a steeper rate of rise and larger maximal force development in strips from spontaneously hypertensive rats (SHR) than those from Wistar-Kyoto rats (*Eur. J. Pharmacol.* 1988, 151, 409); in papillary muscles of guinea pigs and shrews, ouabain produced a concentration-dependent (0.01 to 0.3 μ M) positive inotropic response of similar magnitude, whereas in rats, ouabain at a concentration of 0.1 to 3.0 μ M elicited a negative inotropic effect (*J. Pharm. Pharmacol.* 1989, 41, 212).

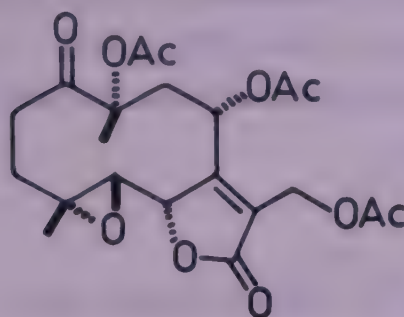
STRUCHIUM (Asteraceae)

S. sparaganophorum (L.) O. Kuntze (*sparaganophora*)

A new germacrane derivative (I) isolated from aerial parts and its structure determined (*Ann. Chem.* 1987, 111).

Distribution : Kerala and Nicobar Islands.

NEW COMPOUNDS



I

STRYCHNOS (Strychnaceae)

S. cinnamomifolia Thw.; see *S. wallichiana* Steud. ex DC.

S. colubrina L.; see *S. wallichiana* Steud. ex DC.

S. ignatii Berg. syn. *S. maingayi* Cl. var. *fruticosa* Cl. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 650).

Brucine (1.5%) and strychnine isolated as major alkaloids (*Tap. Chi Duoc Hoc* 1987, 18, 26; *Chem. Abstr.* 1988, 109, 3863 p).

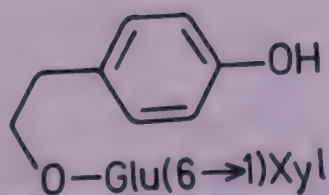
S. maingayi Cl. var. *fruticosa* Cl.; see *S. ignatii* Berg.

S. malaccensis Clarke; see *S. wallichiana* Steud. ex DC.

S. nux-vomica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 613).

Synthesis of loganin (*J. Chem. Soc. Perkin 1* 1985, 2625); isolation of brucine, icajine, novacine, strychnine and vomicine from flowers (*Planta Med.* 1988, 54, 363); a phenolic glycoside - cuchilosite - isolated from fruit pulp along with salidroside and its structure determined (*Phytochemistry* 1989, 28, 1553).

NEW COMPOUNDS



Cuchilosite

S. rheedi Clarke; see *S. wallichiana* Steud. ex DC.

S. wallichiana Steud. ex DC. syn. *S. colubrina* L. (non auct.) nom. confusum, *S. cinnamomifolia* Thw., *S. rheedi* Clarke, *S. malaccensis* Clarke (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 614).

Brucine, its N-oxide, β -colubrine, novacine, strychnine and vomicine isolated from leaves (*Indian Drugs* 1988, 26, 90).

SUAEDA (Chenopodiaceae)

S. maritima (L.) Dum. syn. *S. nudiflora* (Willd.) Moq.

H. - Kharilani; Eng. - Common Indian saltwort; Mar. & Guj. - Moras, Lanalani, Lano; Oriya - Geria; Tam. - Vellakeerai, Nariumari, Uppukeerai; Tel. - Ilakoora, Ravakada.

Ceryl alcohol, 6,7-dimethoxycoumarin and β -sitosterol isolated from aerial parts; galactose, glucose, fructose, aspartic acid, glutamic acid, alanine, glycine, leucine and proline identified in aerial parts by PC (*Karachi Univ. J. Sci.* 1985, 13, 113; *Chem. Abstr.* 1987, 107, 151208 c).

Distribution : Coastal regions of Bengal, Maharashtra and peninsular India.

S. monoica Forsk. ex J.F. Gmel. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 237).

A process for isolation of histamine developed (*Acta Pharm. Suec.* 1985, 22, 275; *Chem. Abstr.* 1986, 104, 95326 p).

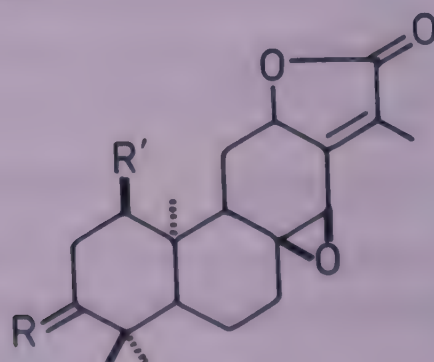
S. nudiflora (Willd.) Moq.; see *S. maritima* (L.) Dum.

SUREGADA (Euphorbiaceae)

S. multiflora (Juss.) Bill. syn. *Gelonium multiflorum* Juss. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 396).

Six novel diterpene lactones - gelomulides A, B, C, D, E and F - isolated from leaves and their structures elucidated; jolkinolide B, multiflorenol and sitosterol also isolated; conformation of jolkinolide B determined (*Phytochemistry* 1989, 28, 1181).

NEW COMPOUNDS



Gelomulide A

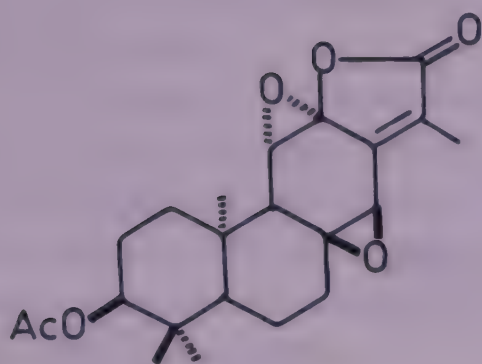
R = β -OAc, H, R' = H

Gelomulide C

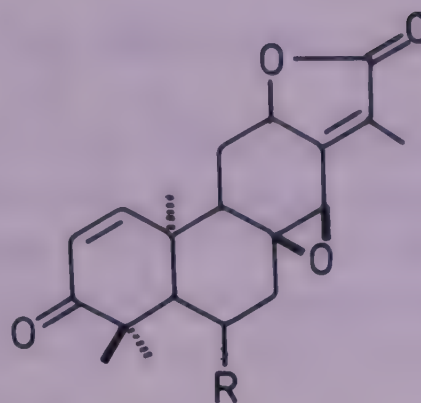
R = O, R' = H

Gelomulide F

R = O, R' = OAc



Gelomulide B



Gelomulide D

R = H

Gelomulide E

R = OAc

SUTERA (Scrophulariaceae)

S. dissecta (Delile) Walp. syn. *S. glandulosa* Roth, *Jamesbrittenia dissecta* (Delile) O. Kuntze
Aucubin isolated from aerial parts (*J. Nat. Prod.* 1986, 49, 366).

Distribution : Bengal, Bihar, southwards to peninsular India.

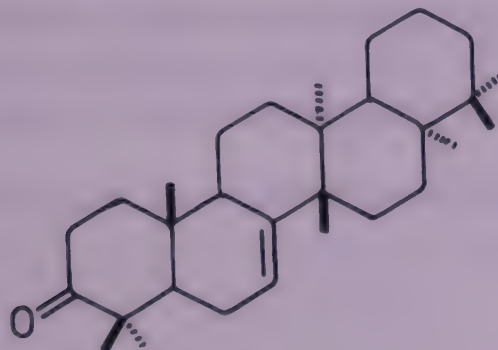
S. glandulosa Roth; see *S. dissecta* (Delile) Walp.

SWERTIA (Gentianaceae)

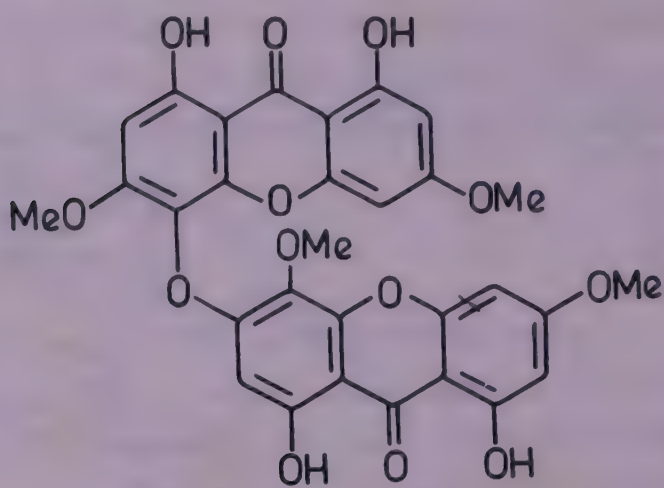
S. chirata (Wall.) Clarke; see *S. chirayita* (Roxb. ex Flem.) Kars.

S. chirayita (Roxb. ex Flem.) Kars. syn. *S. chirata* (Wall.) Clarke, *Gentiana chirayita* Roxb. ex Flem., *Ophelia chirata* Griseb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 615).

Isolation and structure determination of a new dimeric xanthone - chiratanin (*Tetrahedron Lett.* 1987, 28, 1309); a new triterpene - swertanone - isolated from aerial parts and its crystal structure elucidated (*Chem. Commun.* 1989, 438).

NEW COMPOUNDS

Swertanone

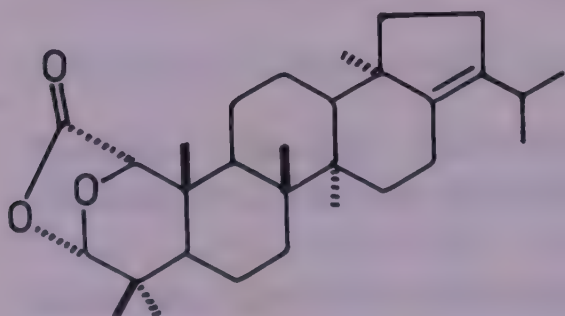


Chiratanin

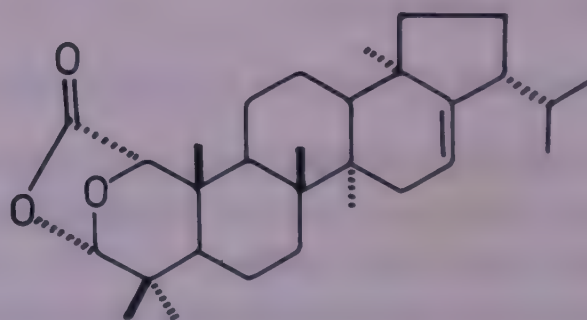
S. petiolata Royle (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 617).

Isolation of two new isomeric 2,3-secohopene lactones - swertialactone C and swertialactone D - and their structure elucidation (*Phytochemistry* 1987, 26, 3363); a new triterpene isolated and characterised as 3β -hydroxylup-13(18)-ene; 3β -hydroxylup-12-en-28-oic acid and ursolic acid also isolated (*Phytochemistry* 1988, 27, 539); isolation of a new xanthone - 1,3-dihydroxy-5,8-dimethoxyxanthone - and its structure determination; 2-hydroxydimethyl terephthalate also isolated (*J. Nat. Prod.* 1988, 51, 379).

NEW COMPOUNDS



Swertialactone C



Swertialactone D

S. speciosa D. Don syn. *S. speciosa* D. Don var. *perfoliata* (G. Don) Clarke (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 657).

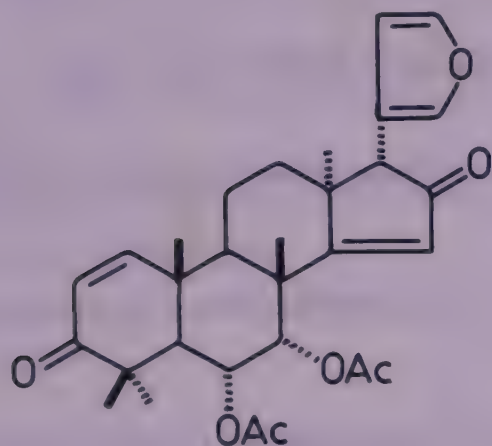
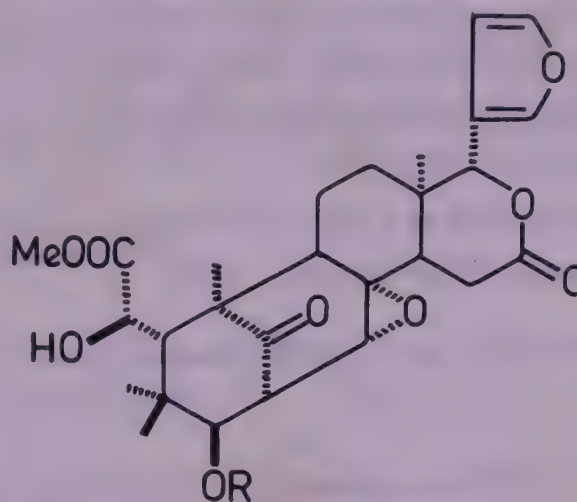
A new xanthone glycoside - 1-hydroxy-8-glucosyloxy-3,5-dimethoxyxanthone - isolated from aerial parts along with 1,8-dihydroxy-3,7-dimethoxyxanthone, 3-methoxy-1,5,8-trihydroxyxanthone and ursolic acid (*Phytochemistry* 1988, 27, 1910).

S. speciosa D. Don var. *perfoliata* (G. Don) Clarke; see *S. speciosa* D. Don

SWIETENIA (Meliaceae)

S. mahagoni (L.) Jacq. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 618).

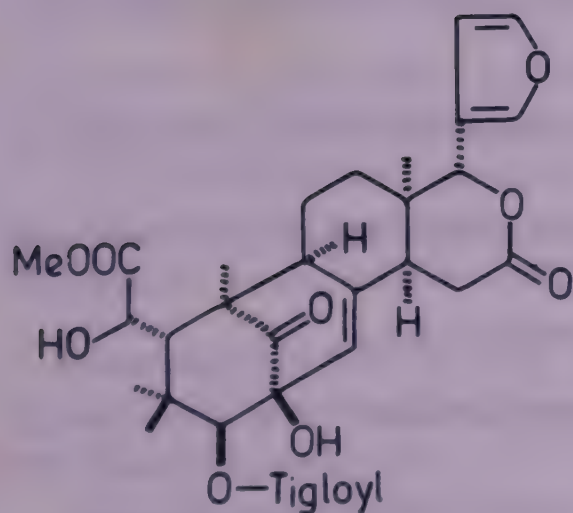
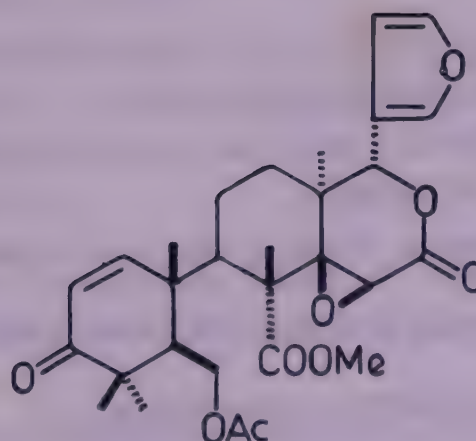
A new limonoid - 2-hydroxyswietenine - isolated along with swietenine (Z. *Naturforsch.* 1985, 40C, 519; *Chem. Abstr.* 1985, 103, 193129 a); new tetranortriterpenoids - swietemahonin A, swietemahonin E and 3-acetylswietenolide - isolated and their structures established (*Tetrahedron Lett.* 1989, 30, 1111); isolation of two more new tetranortriterpenoids-mahonin and secomahoganin - from cotyledons and their structure determination by 2D-NMR (*Chem. Pharm. Bull.* 1989, 37, 1419).

NEW COMPOUNDS**Mahonin****Swietemahonin A**

R = Propionyl

Swietemahonin E

R = Tigloyl

**2-Hydroxyswietenine****Secomahoganin**

BIOLOGICAL ACTIVITY

Swietemahonins A and E and 3-acetylswietenolide inhibited rabbit platelet aggregation; swietemahonin A showed most potent (97.4% inhibition) anti-PAF activity (*Tetrahedron Lett.* 1989, 30, 1111).

SYMPLOCOS (Symplocaceae)

S. caudata Wall. ex G.Don; see *S. sumuntia* D.Don

S. cochinchinensis (Lour.) Moore ssp. *laurina* (Retz.) Nootboom var. *laurina* syn. *S. spicata* Roxb., *S. spicata* Roxb. var. *laurina* (Retz.) Clarke, *S. spicata* Roxb. var. *malasica* Clarke, *S. spicata* Roxb. var. *attenuata* (A.DC.) Clarke (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 618).

α -Spinasterol isolated from stem bark (*J. Res. Ayurveda & Siddha* 1986, 7, 146).

BIOLOGICAL ACTIVITY

α -Spinasterol at a dose of 25.0 mg/kg exhibited significant anti-inflammatory activity (*J. Res. Ayurveda & Siddha* 1986, 7, 146).

S. spicata Roxb.; see *S. cochinchinensis* (Lour.) Moore ssp. *laurina* (Retz.) Nootboom var. *laurina*

S. spicata Roxb. var. *attenuata* (A.DC.) Clarke; see *S. cochinchinensis* (Lour.) Moore ssp. *laurina* (Retz.) Nootboom var. *laurina*

S. spicata Roxb. var. *laurina* (Retz.) Clarke; see *S. cochinchinensis* (Lour.) Moore ssp. *laurina* (Retz.) Nootboom var. *laurina*

S. spicata Roxb. var. *malasica* Clarke; see *S. cochinchinensis* (Lour.) Moore ssp. *laurina* (Retz.) Nootboom var. *laurina*

S. sumuntia D.Don syn. *S. caudata* Wall. ex G.Don, *S. sumuntia* D.Don var. *floribunda* A.DC.

Khasi - Eing-marangsnah.

Cineole, cyclofenchene and ocimene isolated (*Huaxue Shijie* 1986, 27, 259; *Chem. Abstr.* 1987, 107, 130858 z).

Distribution : Nepal to Bhutan and Khasia Hills, ascending to 900 m.

S. sumuntia D.Don var. *floribunda* A.DC.; see *S. sumuntia* D.Don

SYNADENIUM (Euphorbiaceae)

S. grantii Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 619).

4-Deoxyphorbol-12-tiglate-13-phenylacetate, 12-tiglate-13-isobutyrate and 12-tiglate-13-phenylacetates of 4,20-dideoxy-5 α -hydroxyphorbol and 20-deoxy-5 α -hydroxyphorbol isolated (*Planta Med.* 1988, 54, 506).

BIOLOGICAL ACTIVITY

4-Deoxyphorbol-12-tiglate-13-phenylacetate was highly irritant to mouse ear but had almost no tumor-promoting activity (*Planta Med.* 1988, 54, 506).

SYRINGA (Oleaceae)

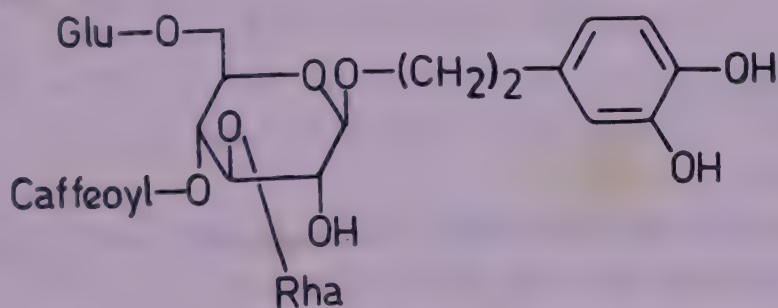
S. vulgaris L.

Eng. - Common lilac.

Rutin and kaempferol-3-O-rutinoside isolated from violet flowers (*Pakistan J. Sci. Ind. Res.* 1987, 30, 150; *Chem. Abstr.* 1988, 108, 19199 s); echinacoside isolated from fresh white flowers and its structure determined (*J. Chem. Soc. Pak.* 1987, 9, 451; *Chem. Abstr.* 1988, 108, 72104 h).

Distribution : Introduced into Indian gardens in hills.

NEW COMPOUNDS



Echinacoside

SYZYGIUM (Myrtaceae)

S. alternifolium (Wight) Walp. syn. *Eugenia alternifolia* Wight

Tel. & Tam. - Manchi-Moyadi, Mogi.

A di-C-methylflavone - sideroxylin (4,5-dihydroxy-7-methoxy-6,8-dimethylflavone) - isolated from leaves (*Indian J. Chem.* 1989, 28B, 199).

Distribution : Assam, Andhra Pradesh and Tamil Nadu.

S. aromaticum (L.) Merr. & Perry syn. *Eugenia caryophyllata* Thunb., *E. caryophyllus* (Spreng.) Bullock & Harrison (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 620).

Acetophenone, benzyl salicylate, α -cadinol, γ -decalactone, fenchone, hexanal, 2-hexanone, methyl palmitate, γ -muurolene, palustrol, propyl benzoate, β -selinene and α -thujene identified in volatile oil (*Agric. Biol. Chem.* 1985, 49, 1538); caryophylla-4(12),8(13)-

dien-5 β -ol, caryophylla-3,8(13)-dien-5 α -ol, caryophylla-3,8(13)-dien-5 β -ol and 4,4'-dimethyltricyclo(6,3,2,0)-trideca-8-en-1-ol found to be present in oil (*Agric. Biol. Chem.* 1986, 50, 1903).

S. cumini (L.) Skeels syn. *Eugenia jambolana* Lam. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 621).

In nondiabetics fruit pulp induced small but statistically significant fall in blood sugar at 3 hr whereas in diabetic patients a small increase in blood sugar level was observed following fruit pulp ingestion; thus, fruits have no significant role in management of diabetes (*J. Res. Ayurveda & Siddha* 1983, 4, 1).

Determination of oleic (32.2), myristic (31.7), linoleic (16.1), stearic (6.5), palmitic (4.7), vernolic (3.0), lauric (2.8), sterculic (1.8) and malvalic (1.2%) acids in seed oil (*J. Sci. Food Agric.* 1988, 43, 91; *Chem. Abstr.* 1988, 108, 183688 w).

S. samarangense (Bl.) Merr. & Perry syn. *Eugenia javanica* Lamk. p.p. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 661).

γ -Terpinene (28.5), α -pinene (18.2) and p-cymene (13.7%) determined in leaf oil (*Flavour Fragrance J.* 1987, 2, 37; *Chem. Abstr.* 1988, 108, 81785 h).

TABEBUIA (Bignoniaceae)

T. chrysantha Nichols.

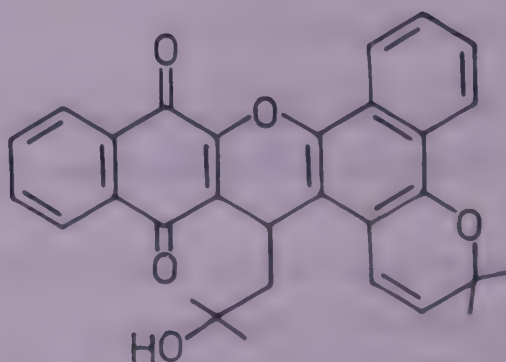
2-(1-Hydroxyethyl)naphtho[2,3-b]furan-4,9-dione and 2-acetylnaphtho[2,3-b]furan-4,9-dione isolated from bark (*J. Nat. Prod.* 1988, 51, 1023).

Distribution : Introduced into Indian gardens.

T. pentaphylla (L.) Hemsl. syn. *Tecoma pentaphylla* Juss. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 621).

A new quinone - tecomaquinone III - isolated from heartwood and its structure established (*Phytochemistry* 1988, 27, 632).

NEW COMPOUNDS



Tecomaquinone III

T. rosea DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 622).

2-Acetylnaphtho[2,3-b]furan-4,9-dione, 2-(1-hydroxyethyl)naphtho[2,3-b]furan-4,9-dione and 5(or 8)-hydroxy-2-(1-hydroxymethyl)naphtho[2,3-b]furan-4,9-dione isolated from stem bark whereas wood contained lapachol and dehydro-a-lapachone (*J. Nat. Prod.* 1988, 51, 1023).

T. serratifolia (Vahl) Nichols. syn. *Tecoma serratifolia* G. Don

Eng. - Trumpet flower tree.

Isolation of α -ethylfurano-1,4-naphthoquinone, lapachol, α -lapachone and dehydro- α -lapachone from trunkwood (*Ann. Pharm. Fr.* 1988, 46, 55; *Chem. Abstr.* 1988, 109, 208265 s).

Distribution : Tamil Nadu.

TABERNAEMONTANA (Apocynaceae)

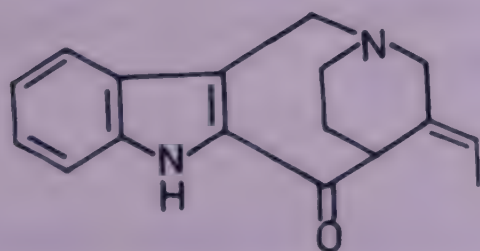
T. coronaria R.Br.; see *T. divaricata* (L.) R.Br. ex R. & S.

T. dichotoma Roxb.; see *Ervatamia dichotoma* (Roxb.) Blatter

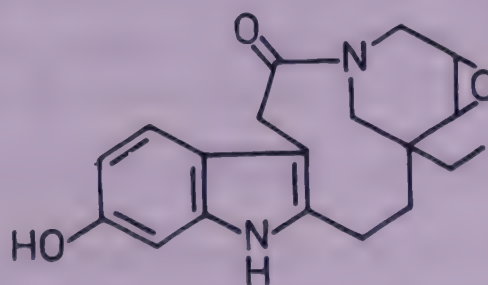
T. divaricata (L.) R.Br. ex R. & S. syn. *T. coronaria* R.Br., *Ervatamia coronaria* Stapf, *E. divaricata* (L.) Alston (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 622).

A new indolenine alkaloid - lahoricine - isolated from leaves and its structure established (*Z. Naturforsch.* 1984, 39B, 1289; *Chem. Abstr.* 1985, 102, 42842 f); ibogamine synthesised (*Chem. Pharm. Bull.* 1985, 33, 4202; *J. Org. Chem.* 1985, 50, 1460); isolation of an indole alkaloid - ervatinine - from leaves and its structure determination (*Phytochemistry* 1985, 24, 2473); a new 2-acylindole alkaloid - ervaticine - from leaves and its structure determined (*Heterocycles* 1985, 23, 2975); isolation and structure elucidation of a new dimeric indole alkaloid - pseudovobparicine - from root bark (*Planta Med.* 1985, 51, 277); a new indole alkaloid - stapfinine - isolated from leaves and its structure established (*Phytochemistry* 1986, 25, 1781); 20(S)19,20-dihydrocondylocarpine isolated from leaves and its stereochemistry at C-20 established (*Planta Med.* 1986, 52, 325).

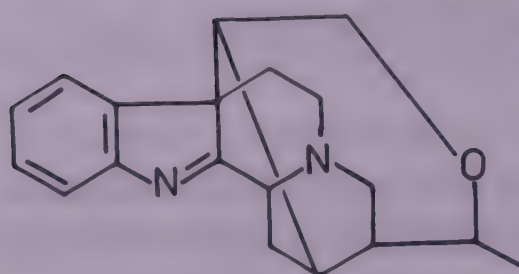
NEW COMPOUNDS



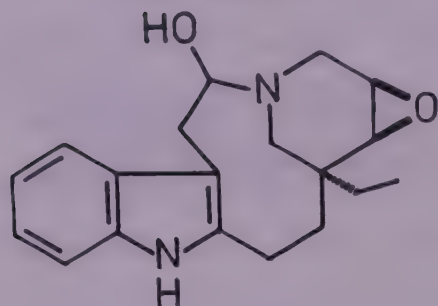
Ervaticine



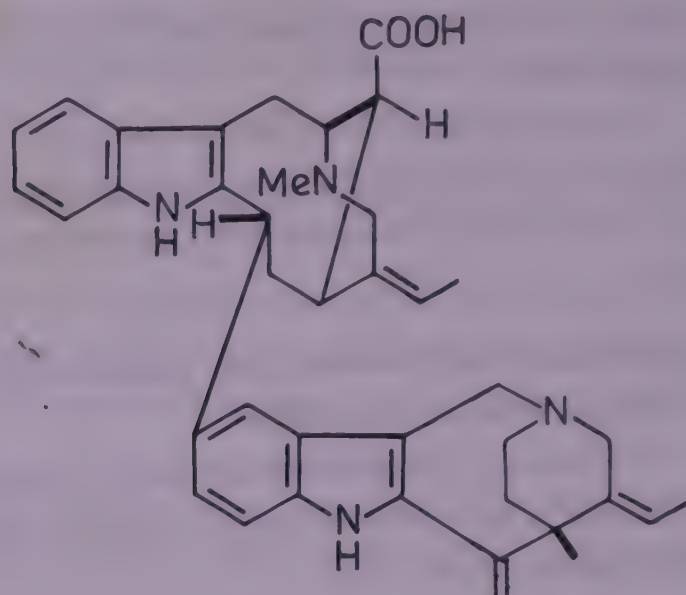
Ervatinine



Lahoricine



Stapfinine



Pseudovobparicine

TAGETES (Asteraceae)

T. erecta L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 623).

β -Caryophyllene, limonene, myrcene and piperitone (15.0%) found to be present in essential oil (*Flavour Fragrance J.* 1986, 1, 169; *Chem. Abstr.* 1987, 107, 161480 z; *Herba Hung.* 1987, 26, 49; *Chem. Abstr.* 1987, 107, 151202 w).

T. glandulifera Schrank; see *T. minuta* L.

T. minuta L. syn. *T. glandulifera* Schrank (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 624).

Essential oil exhibited antimicrobial activity against fungi, Gram-positive and Gram-negative microorganisms (*Flavour Fragrance J.* 1986, 1, 169; *Chem. Abstr.* 1987, 107, 161480 z; *Herba Hung.* 1987, 26, 49; *Chem. Abstr.* 1987, 107, 151202 w).

Dihydrotagetone, tagetone, β -ocimene, (E) and (Z)ocimenones identified in flower essential oil by GC-MS (*Flavour Fragrance J.* 1986, 1, 169; *Chem. Abstr.* 1987, 107, 161480 z; *Herba Hung.* 1987, 26, 49; *Chem. Abstr.* 1987, 107, 151202 w); determination of linoleic (51.95), palmitic (21.64), oleic (16.23%), myristic, stearic and linolenic acids in seed oil (*Pakistan J. Sci. Ind. Res.* 1987, 30, 700; *Chem. Abstr.* 1988, 108, 201732 n).

T. signata Bartl.; see *T. tenuifolia* Cav.

T. tenuifolia Cav. syn. *T. signata* Bartl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 624).

Dihydrotagetone, tagetone, β -ocimene, (E) and (Z)ocimenones identified in flower essential oil by GC-MS (*Flavour Fragrance J.* 1986, 1, 169; *Chem. Abstr.* 1987, 107, 161480 z; *Herba Hung.* 1987, 26, 49; *Chem. Abstr.* 1987, 107, 151202 w).

TALAUMA (Magnoliaceae)

T. phellocarpa King; see *Magnolia baillonii* Pierre

TAMARIX (Tamaricaceae)

T. gallica L.; see *T. indica* Willd.

T. indica Willd. syn. *T. gallica* sensu Dyer (non L.), *T. troupii* Holle (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 625).

n-Hentriacontane, n-nonacosane, n-heptacosane, hentriacontan-12-ol and n-triacontanol isolated from aerial parts (*J. Indian Chem. Soc.* 1984, 61, 820); troupin isolated from leaves and identified as 4-methyl-6-hydroxy-7,8-dimethoxycoumarin (*Phytochemistry* 1985, 24, 871).

T. troupii Holle; see *T. indica* Willd.

TANACETUM (Asteraceae)

T. nubigenum Wall. ex DC.; see *Dendranthema mutellina* (Hand.-Mazz.) Kitamura

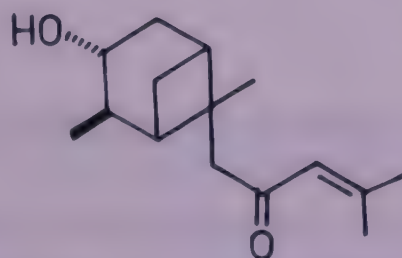
T. vulgare L. syn. *Chrysanthemum vulgare* (L.) Bernh.

Eng. - Tansy.

A new oxygenated sesquiterpene - tanavulgarol - isolated and its structure elucidated (*Phytochemistry* 1987, 26, 3077).

Distribution : Native of Europe, found as weed in Jammu, Srinagar and adjoining localities in J. & K. State.

NEW COMPOUNDS

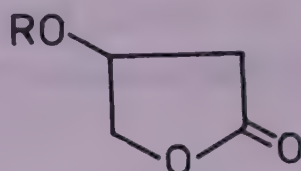


Tanavulgarol

TARAXACUM (Asteraceae)

T. officinale Weber ex Wigg. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 626).

A new acylated γ -butyrolactone glucoside - taraxacoside - isolated from roots and characterised as β -O-[4'-O-(p-hydroxyphenylacetyl)- β -D-glucopyranosyl]- β -hydroxy- γ -butyrolactone; tetrahydroridentin B, a eudesmanolide- β -D-glucopyranoside and two germacranolides also isolated (*Phytochemistry* 1985, 24, 1557); esculetin, scopoletin and caffeic, ferulic, p-hydroxybenzoic, p-hydroxyphenylacetic, protocatechuic and vanillic acids, luteolin and its 7β -D-glucoside, 7β -gentiobioside, 7β -rhamnoglucoside, 3'-glucoside and 4'-glucoside, quercetin and its 7β -D-glucoside, isorhamnetin-3 β -D-glucoside and isorhamnetin-3,7 β -D-diglucoside isolated (*Acta Pol. Pharm.* 1985, 42, 215; *Chem. Abstr.* 1986, 104, 183293 f).

NEW COMPOUNDS

Taraxacoside

R = Glu-4'-p-hydroxyphenylacetyl

TAXUS (Taxaceae)

T. baccata L.; see *T. wallichiana* Zucc.

T. wallichiana Zucc. syn. *T. baccata* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 626).

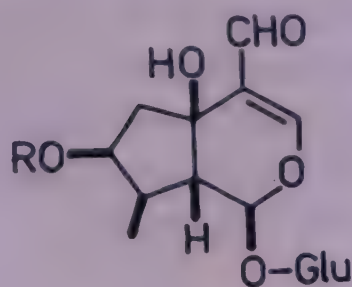
Amentoflavone, mono- and di-O-methylamentoflavones and sciadopitysin isolated from leaves of Himalayan plant (*J. Nat. Prod.* 1985, 48, 994); synthesis of taxol (*J. Am. Chem. Soc.* 1988, 110, 5917); isolation of ginkgetin, sequoiaflavone and sciadopitysin from leaves and branches (*Zhiwu Xuebao* 1989, 31, 54; *Chem. Abstr.* 1989, 11, 191505 m).

TECOMA (Bignoniaceae)

T. capensis Lindl. syn. *Tecomaria capensis* (Thunb.) Spach (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 627).

Four new iridoids - 7-O-trans-cinnamoyltecomoside (I), 7-O-(p-methoxy)-trans-cinnamoyltecomoside (II), 7-O-(p-hydroxy)-trans-cinnamoyltecomoside (III) and 7-O-(p-hydroxy)benzoyltecomoside (IV) - isolated along with tecomoside and their structures determined; structure of tecomoside, isolated earlier (*Gazz. Chim. Ital.* 1975, 105, 195), revised (*J. Nat. Prod.* 1983, 46, 314).

NEW COMPOUNDS



Tecomoside

R = H

I

R = Cinnamoyl

II

R = Cinnamoyl(4-OMe)

III

R = Cinnamoyl(4-OH)

IV

R = Benzoyl(4-OH)

T. grandiflora (Thunb.) Loisel; see *Campsis grandiflora* (Thunb.) K.Schum.

T. pentaphylla Juss.; see *Tabebuia pentaphylla* (L.) Hemsl.

T. serratifolia G.Don; see *Tabebuia serratifolia* (Vahl) Nichols.

T. stans (L.) Juss. ex H.B. & K. syn. *Stenolobium stans* (L.) D.Don (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 627).

Indole, tryptophan, tryptamine and skatole isolated from leaves (*Phytochemistry* 1984, 23, 1826); isolation of chrysoeriol, hyperoside and luteolin from fresh leaves (*Fitoterapia* 1986, 57, 281).

T. undulata (Roxb.) G.Don; see *Tecomella undulata* (Sm.) Seem

TECOMARIA (Bignoniaceae)

T. capensis (Thunb.) Spach; see *Tecoma capensis* Lindl.

TECOMELLA (Bignoniaceae)

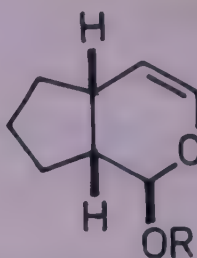
T. undulata (Sm.) Seem syn. *Tecoma undulata* (Roxb.) G.Don (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 628).

Alcoholic extract (25.0 mg/kg) increased body weight of experimental rats significantly but decreased collagen content of liver and B.S.P. test values significantly. However, it showed

no significant effect on levels of alkaline phosphatase, SGOT, SGPT, thymol turbidity, mucopolysaccharide, DNA and RNA in liver (*J. Res. Ayurveda & Siddha* 1980, 1, 77).

A new ferulic ester - octacosanylacetylferulate - isolated from heartwood along with octacosanyl ferulate, deoxylapachol, lapachol, dehydro- α -lapachone, tectol, dehydrotectol and tectoquinone (*Planta Med.* 1986, 52, 71); isolation of a new iridoid glucoside - undulatin - and its structure determination (*Planta Med.* 1986, 52, 359).

NEW COMPOUNDS



Undulatin

R = Glu(4-p-coumaroyl)

TECTONA (Verbenaceae)

T. grandis L.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 628).

Isolation of betulin, betulin aldehyde, betulinic acid and lupeol from stem bark (*Indian J. Pharm. Sci.* 1988, 50, 124); a new 1,4-anthraquinone derivative - 9,10-dimethoxy-2-methyl-anthra-1,4-quinone - isolated from heartwood along with dehydro- α -lapachone, lapachol, tecomaquinone I and tectoquinone (*Phytochemistry* 1989, 28, 1258).

BIOLOGICAL ACTIVITY

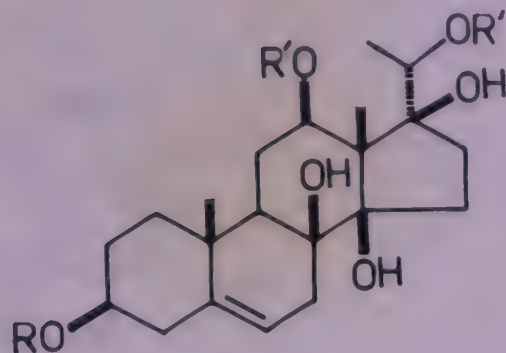
Lapachol at a dose of 5.0 mg/kg orally (twice daily for 3 days) was found to prevent experimental induction of gastric and duodenal ulcers in rats and guinea pigs; antiulcerogenic action appears to be associated with its effect on protein content of gastric juice. It reversed aspirin-induced changes in peptic activity, protein and sialic acid (*J. Pharm. Pharmacol.* 1987, 39, 138).

TELOSMA (Asclepiadaceae)

T. pallida (Roxb.) Craib syn. *Pergularia pallida* W. & A. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 629).

Two new pregnane ester glycosides - pallidine and pallidine - isolated from twigs and characterised as 3-O- β -D-oleandroside and 3-O- β -D-cymaropyranosyl(1 \rightarrow 4)- β -D-oleandroside of 12,20-di-O-benzoylsarcostin respectively (*Phytochemistry* 1984, 23, 2931); sarcogenin isolated (*Phytochemistry* 1986, 25, 491).

NEW COMPOUNDS



Pallidine

R = Oleandrose, R' = Benzoyl

Pallidine

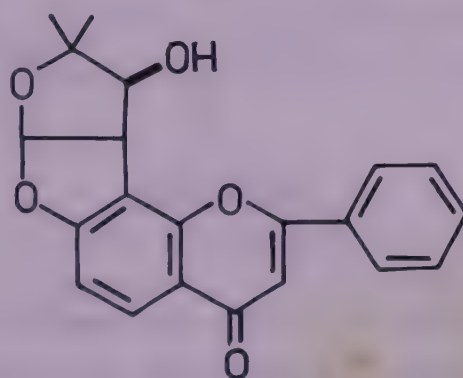
R = Oleandrose(4 \rightarrow 1)Cymarose, R' = Benzoyl

TEPHROSIA (Papilionaceae)

T. apollinea (Delile) Link (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 629).

Isolation and structure determination of a new flavone - pseudosemiglabrinol; semi-glabinol also isolated (*Phytochemistry* 1986, 25, 955).

NEW COMPOUNDS

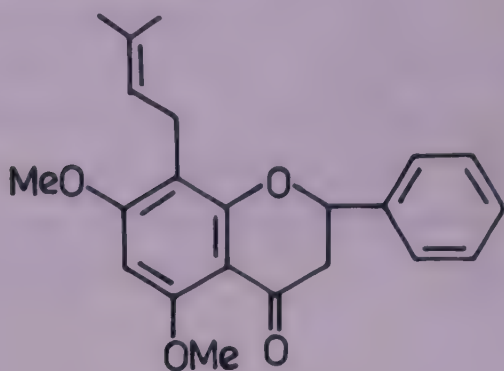


Pseudosemiglabrinol

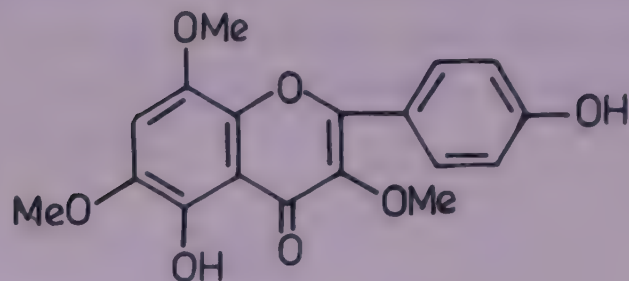
T. candida (Roxb.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 630).

A new flavanone - candidone - isolated from leaves and stems and its structure elucidated; ovalichalcone and dehydrorotenone also isolated (*Phytochemistry* 1986, 25, 961); isolation of a new flavone - candirone - from seeds along with penduletin and its crystal structure determination (*Tetrahedron* 1987, 43, 4241); stems and leaves afforded dehydrodihydrorotenone and flemichapparin B (*Phytochemistry* 1987, 26, 2423); caffeic acid, 12a-hydroxyrotenone, sitosterol, its glucoside and tephrosin isolated from seeds; separation of tephrosin and 12a-hydroxyrotenone by HPLC (*J. Nat. Prod.* 1988, 51, 185).

NEW COMPOUNDS



Candidone

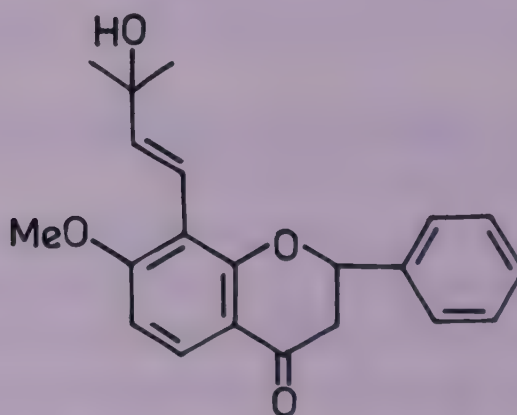


Candirone

T. falciformis Ramaswami (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 631).

A new flavanone - falciformin - isolated from pods and its structure determined; 7-hydroxy-8-(γ,γ -dimethylallyl)flavanone also isolated (*Phytochemistry* 1986, 25, 767).

NEW COMPOUNDS



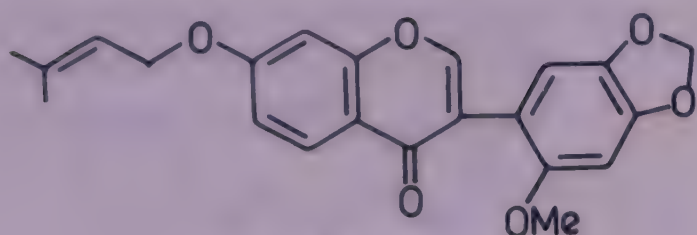
Falciformin

T. hamiltonii Drum. ex Gamble; see *T. purpurea* (L.) Pers.

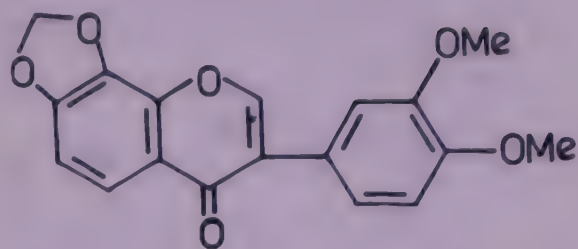
T. maxima (L.) Pers. syn. *T. purpurea* (L.) Pers. var. *maxima* Baker (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 404).

Maxima isoflavones C, D, E, F and G isolated from aerial parts and their structures elucidated; maxima isoflavone A, 7,6'-dimethoxy-3',4'-methylenedioxyisoflavone, 7,8,6'-trimethoxy-3',4'-methylenedioxyisoflavone and 6-methoxy-7-hydroxy-3',4'-methylenedioxyisoflavone also isolated (*Phytochemistry* 1984, 23, 1493); isolation and structure determination of maxima isoflavone H; maxima isoflavone B also isolated (*Phytochemistry* 1985, 24, 875); maxima isoflavone J isolated and its partial structure elucidated (*J. Nat. Prod.* 1985, 48, 967); a new isoflavone isolated from roots and aerial parts and its structure determined as 3',4'-dimethoxyisoflavone and confirmed by synthesis (*Indian J. Chem.* 1987, 26B, 484); structure of maxima isoflavone D confirmed by synthesis (*Indian J. Chem.* 1987, 26B, 1080).

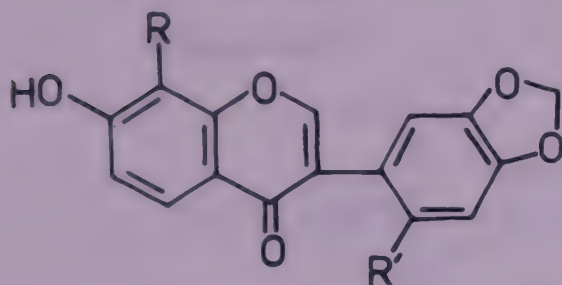
NEW COMPOUNDS



Maxima isoflavone C



Maxima isoflavone D



Maxima isoflavone E

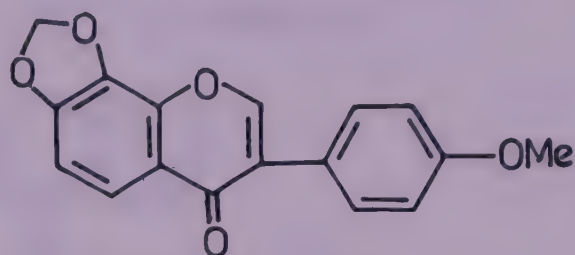
R = OMe, R' = H

Maxima isoflavone F

R, R' = OMe

Maxima isoflavone G

R = H, R' = OMe



Maxima isoflavone H

BIOLOGICAL ACTIVITY

Maxima isoflavones A, C, D and G showed dose-dependent, nonspecific antispasmodic activity in isolated guinea pig ileum, maxima isoflavone G was found to be the most potent (*Indian J. Pharm.* 1986, 48, 140).

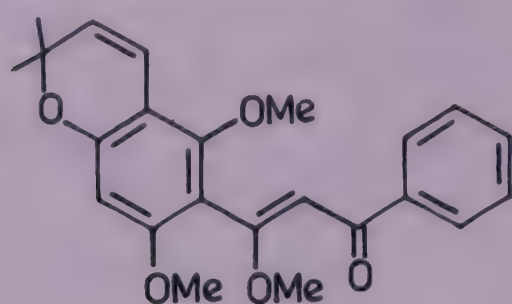
T. procumbens Buch.-Ham.; see *T. pumila* (Lamk.) Pers.

T. pumila (Lamk.) Pers. syn. *T. purpurea* (L.) Pers. var. *pumila* (Lamk.) Baker, *T. procumbens* Buch.-Ham.

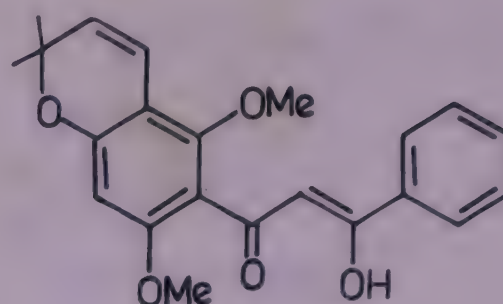
A new β -diketone - praecansone B - isolated from roots along with rotenone, sumatrol, obovatin, praecansone A, 7-ethoxy,3,3',4'-trihydroxyflavone, fisetin-7-ethyl ether and 7,4'-dihydroxy-3'-methoxyisoflavone; new compound characterised (*J. Chem. Soc. Perkin 1* 1987, 2723); structure of praecansone A revised (*J. Chem. Soc. Perkin 1* 1987, 2723; *Phytochemistry* 1988, 27, 1503); two new flavonoids - pumila isoflavone A and pumila isoflavone B - isolated from seed pods of Ethiopian plant and characterised (*Phytochemistry* 1988, 27, 1503; *ibid.* 1989, 28, 1291); isolation and structure elucidation of another two new isoflavonoids - pumila isoflavone C and pumila isoflavone D - from seed pods; praecansone A and its isomer also isolated (*Phytochemistry* 1989, 28, 1291).

Distribution : Throughout plains of India.

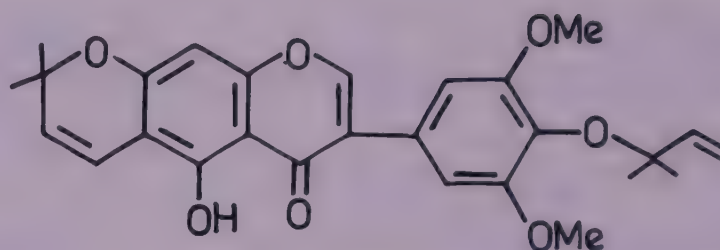
NEW COMPOUNDS



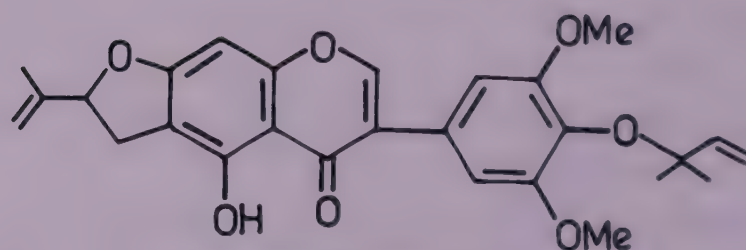
Praecansone A



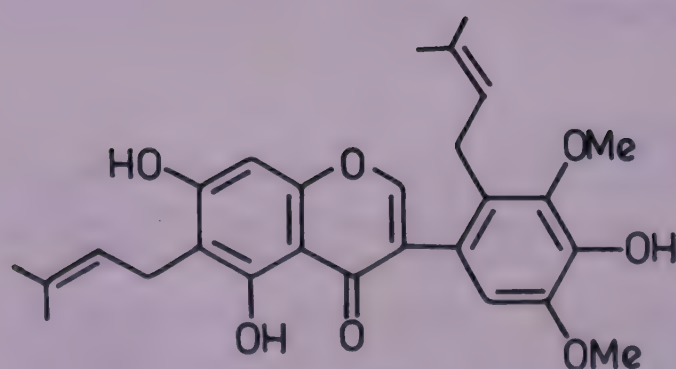
Praecansone B



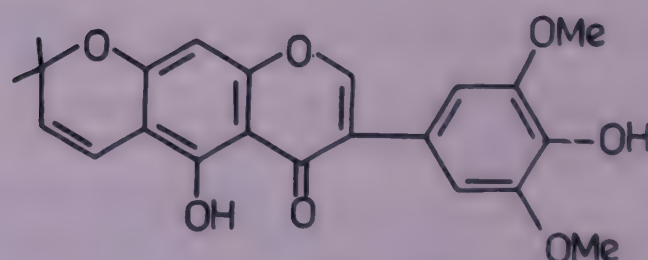
Pumila isoflavone A



Pumila isoflavone B



Pumila isoflavone C



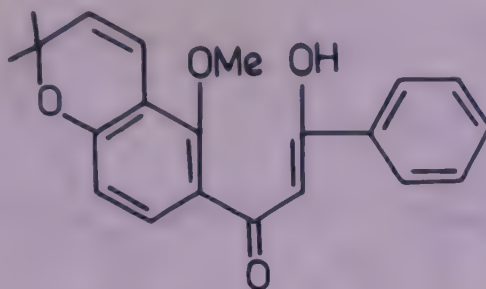
Pumila isoflavone D

T. purpurea (L.) Pers. syn. *T. hamiltonii* Drum. ex Gamble (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 631).

A new β -hydroxychalcone - purpurenone - isolated from roots along with (+)purpurin, dehydroisoderricin and (-)maackiain and its structure established (*Phytochemistry* 1984, 23, 2339); a new epoxyflavanone isolated and characterised as 5,7-dimethoxy-8(2,3-epoxy-3-methylbutyl)flavanone (*Planta Med.* 1987, 53, 220); isolation of a new coumestone - 2-methoxy-3,9-dihydroxycoumestone - from roots and its structure determination (*Phytochemistry* 1988,

27, 648); in addition pongamol, flemichapparins B and C, rutin, methylkaranjic acid, β -sitosterol, spirasterol and ursolic acid isolated (*Phytochemistry* 1988, 27, 648; *J. Indian Chem. Soc.* 1988, 65, 148; *Phytochemistry* 1989, 28, 591).

NEW COMPOUNDS



Purpurenone

T. purpurea (L.) Pers. var. *maxima* Baker; see *T. maxima* (L.) Pers.

T. purpurea (L.) Pers. var. *pumila* (Lamk.) Baker; see *T. pumila* (Lamk.) Pers.

T. vogelii Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 633).

Deguelin, tephrosin, rutin, quercetin-3-O-arabinoside and isoquercitrin isolated from leaves of African plant (*Phytochemistry* 1984, 23, 1824).

TERMINALIA (Combretaceae)

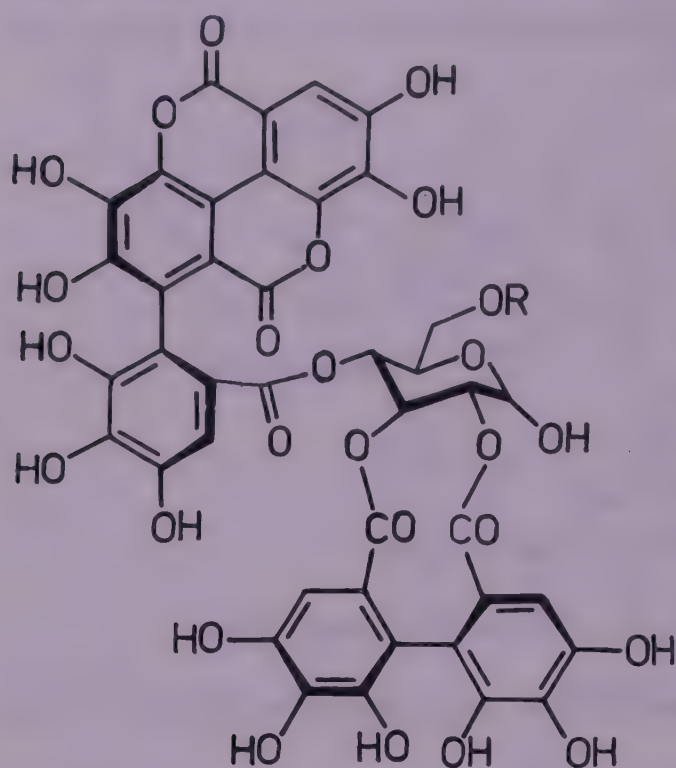
T. alata Heyne ex Roth syn. *T. tomentosa* (DC.) W. & A. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 633).

A new triterpene acid - 3-acetylmaslinic acid - isolated from root bark and its structure elucidated; oleanolic, arjunic and arjunolic acids and arjunetin also isolated (*Phytochemistry* 1986, 25, 2670); isolation of arjunic, arjunolic, betulinic and ellagic acids, and β -sitosterol from bark (*J. Nat. Prod.* 1986, 49, 549).

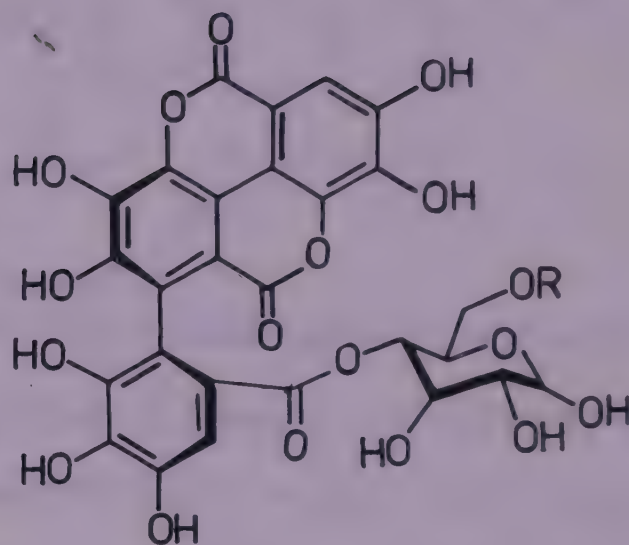
T. catappa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 635).

Four new hydrolysable tannins - terflavins A and B, tergallagin and tercatatin - isolated from leaves and their structures established; punicalin, punicalagin, chebulagic acid, geraniin, granatin B, 1-desgalloyl eugeniin, corilagin and 2,3-[(S)4,4',5,5',6,6'-hexahydroxydiphenoyl]-D-glucose also isolated (*Chem. Pharm. Bull.* 1986, 34, 1039).

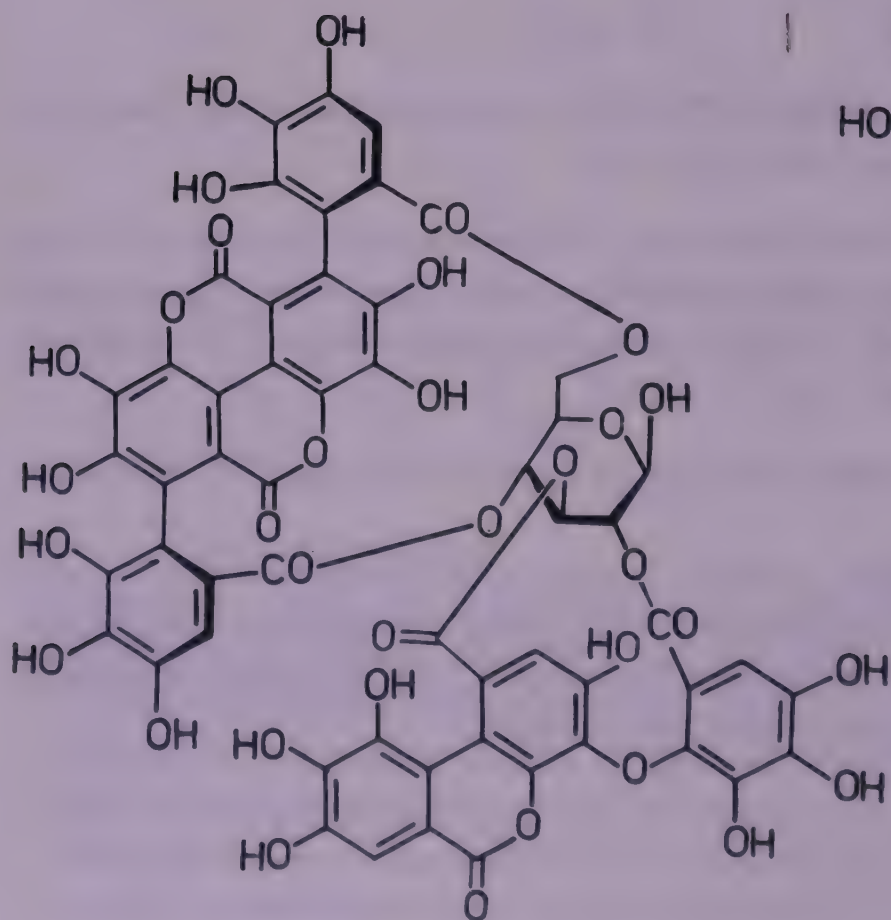
NEW COMPOUNDS



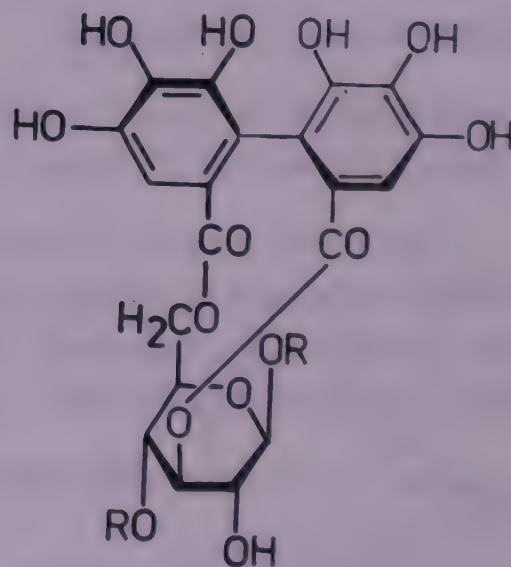
Terflavin A
R = Galloyl



Terflavin B
R = Galloyl



Tergallagin



Tercatatin
R = Galloyl

T. chebula (Gaertn.) Retz. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 635).

Gallic acid (1.21%) from fruits (*Indian J. Nat. Prod.* 1986, 2(2), 10; *Chem. Abstr.* 1987, 107, 74259 r).

T. tomentosa (DC.) W. & A.; see *T. alata* Heyne ex Roth

TETRADIUM (Rutaceae)

T. glabrifolium (Champ. ex Benth.) T.G. Hartley; see *Euodia glabrifolia* (Champ. ex Benth.) Balak

TETRAGONIA (Tetragoniaceae)

T. expansa Murr.; see *T. tetragonoides* (Pall.) O.Ktze.

T. tetragonoides (Pall.) O.Ktze. syn. *T. expansa* Murr. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 636).

A water-soluble HPLC-pure polysaccharide, TIIC, isolated from aerial parts; it was composed of repeating units of an octasaccharide having main chain consisting of (1→6)linked α -D-glucopyranosyl units having acetyl group, arabinose and rhamnose in 3/4 positions (*Chem. Pharm. Bull.* 1985, 33, 3675).

BIOLOGICAL ACTIVITY

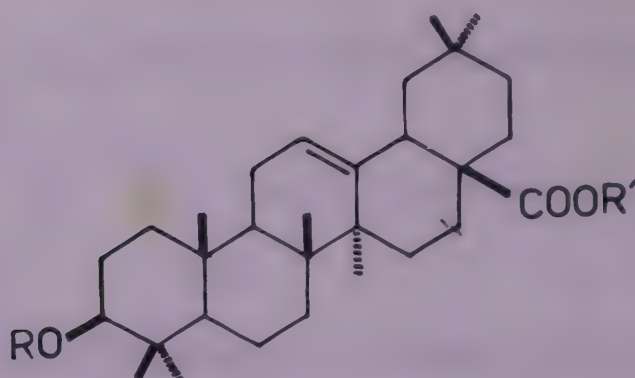
Polysaccharide showed anti-inflammatory effect on carrageenin-induced oedema and adjuvant arthritis (*Chem. Pharm. Bull.* 1985, 33, 3675).

TETRAPANAX (Araliaceae)

T. papyrifera (Hook.) K.Koch (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 637).

Four new triterpenoid glycosides isolated from roots and characterised as β -D-glucopyranosyl oleanate-3-[α -L-arabinofuranosyl(1→4)- β -D-galactopyranosyl(1→2)]methyl(β -D-glucopyranoside)uronate (I), α -L-rhamnopyranosyl(1→4)- β -D-glucopyranosyl(1→6)- β -D-glucopyranosyl oleanate-3- α -L-arabinofuranosyl(1→4)methyl(β -D-glucopyranoside)uronate (II), β -D-glucopyranosyl oleanate-3 β -D-galactopyranosyl(1→2)methyl(β -D-glucopyranoside)uronate (III) and oleanolic acid-3 β -D-galactopyranosyl(1→2)- β -D-fucopyranoside (IV); methyl oleanate-3-[α -L-arabinofuranosyl(1→4)- β -D-galactopyranosyl(1→2)]methyl(β -D-glucopyranoside)uronate and β -sitosterol- β -D-glucopyranoside also isolated (*Chem. Pharm. Bull.* 1985, 33, 4701).

NEW COMPOUNDS



I

R = Me glucuronate[(2→1)Gal](4→1)Ara, R' = Glu

II

R = Me glucuronate(4→1)Ara, R' = Glu(6→1)Glu(4→1)Rha

III

R = Me glucuronate(2→1)Gal, R' = Glu

IV

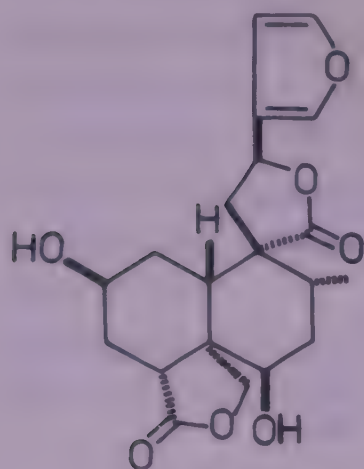
R = Fuc(2→1)Gal, R' = H

TEUCRIUM (Lamiaceae)

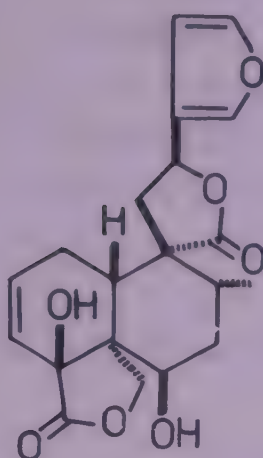
T. chamaedrys L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 638).

A new neoclerodane diterpenoid - isoteuflidin - isolated from aerial parts and its structure determined; structures of teucrins F and G, isolated earlier, revised (*Phytochemistry* 1984, 23, 1465); structure of teucrin B, isolated earlier (*Khim. Prir. Soedin.* 1974, 589), revised to 15,16-epoxy-2 β ,6 β -dihydroxy-neocleroda-13(16),14-dien-18,19:20,12S-diolide and was found to be identical to that of dihydroteugin (*Phytochemistry* 1984, 23, 2960); another new neoclerodane diterpenoid - teuchamaedrin C - isolated from aerial parts and its structure established as (12S,18S)15,16-epoxyneoclerodane-13(16),14-dien-19,20-olide-18,6 β -hemiacetal; in addition 6 α -hydroxyteuscordin and dihydroteugin also isolated (*Phytochemistry* 1985, 24, 301); a new phenylpropanoid glycoside isolated and characterised as 3,4-dihydroxy- β -phenylethoxy- α -L-lyxopyranosyl(1→2)- α -L-rhamnopyranosyl(1→3)(4-O-caffeoyl)- β -D-glucoside (*Phytochemistry* 1988, 27, 1459).

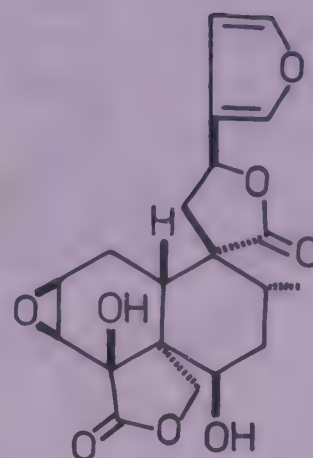
NEW COMPOUNDS



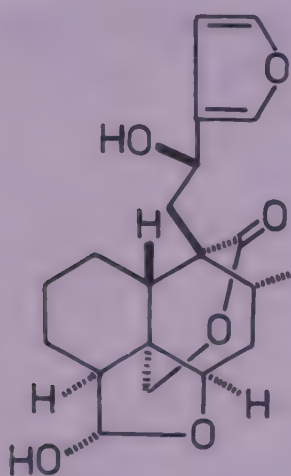
Teucrin B



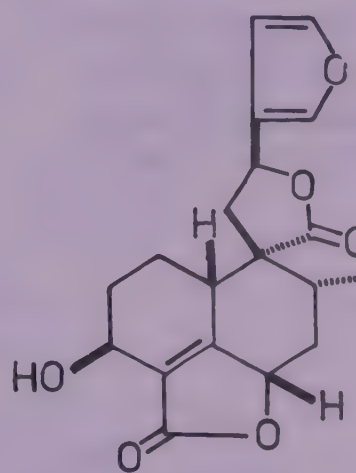
Teucrin F



Teucrin G



Teuchamaedrin C

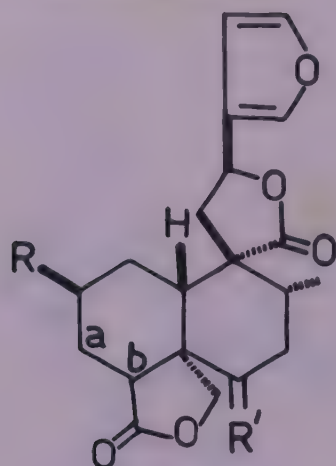


Isoteuflidin

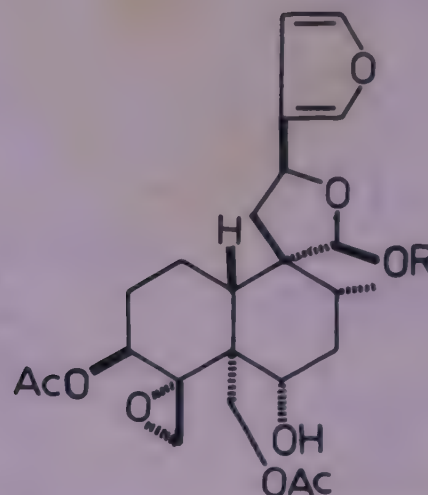
T. scordium L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 640).

Five new clerodane derivatives - 2,3-dehydroteucrin E, 2 β ,6 α -dihydroxyteuscordin, 2 β -hydroxyteuscordinone, 6,20-bisdeacetylteupyreinidin and 6-deacetylteupyreinidin - isolated from aerial parts and their structures elucidated; teucrin E, 6 α -hydroxyteuscordin and its epimer, teuscordinone, teugin, dihydroteugin, teucjaponin- β -acetate and teucroxide also isolated (*Planta Med.* 1985, 51, 341); isolation of 2-keto-19-hydroxyteuscordin from aerial parts along with teucrin E and teucrin H4 and its structure determination (*Phytochemistry* 1985, 24, 297).

NEW COMPOUNDS



2,3-Dehydroteucrin E

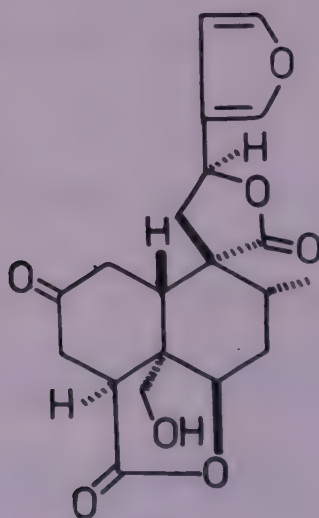
R = H, R' = α -OH, H2 β ,6 α -DihydroxyteuscordinR = OH, R' = α -OH, H2 β -HydroxyteuscordinoneR = OH, R' = O, ab = Δ 

6,20-Bisdeacetylteupyreinidin

R = H

6-Deacetylteupyreinidin

R = Ac



2-Keto-19-hydroxyteuscordin

THALICTRUM (Ranunculaceae)

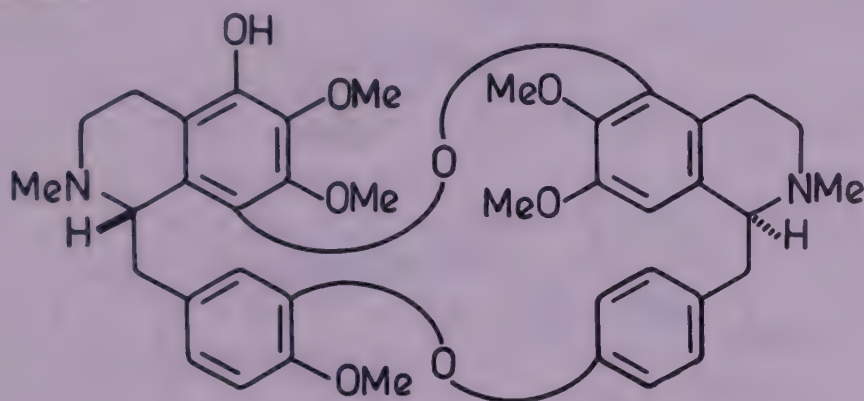
T. cultratum Wall.

A new bisbenzylisoquinoline alkaloid - (-)-2-northalmin - isolated along with (-)-thl-rugosinone and (-)-thl-pindione and structure of new compound determined (*J. Nat. Prod.* 1985, 48, 962); structures of thl-rugosinone and thl-pindione revised (*Stud. Org. Chem.* 1986, 26, 155; *Chem. Abstr.* 1987, 106, 210959 c); isolation and structure elucidation of (-)-thl-miculine, (-)-5-hydroxythl-mine, (+)-thl-miculatimine, (-)-thl-miculimine and (-)-5-hydroxy-thl-idasine (*J. Nat. Prod.* 1986, 49, 488); seven new aporphine alkaloids - (+)-thl-ibulamine, (+)-thl-ifaronine, (+)-thl-ifaramine, (+)-thl-ifaretine, (+)-thl-ifaricine, (+)-thl-ifarazine

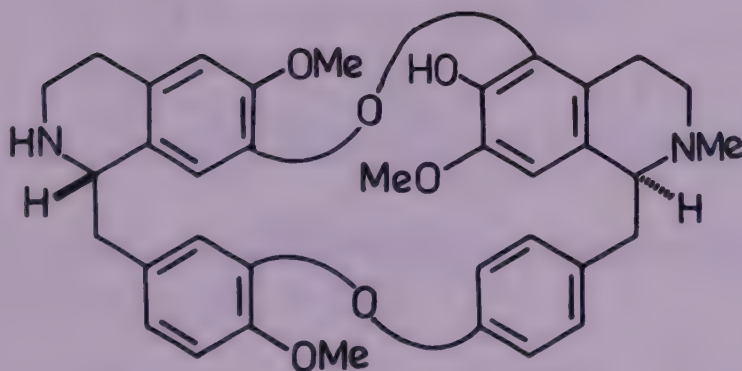
and (+)thalifaroline - isolated and their structures elucidated (*J. Nat. Prod.* 1986, 49, 494); two norbisbenzylisoquinolines - (+)2'-noroxyacanthine and (+)2'-northaliphylline; a diphenolic imine - (+)cultithalminine; six N-oxides - (+)neothalibrine-2'- α -N-oxide, (-)thalrugosaminine-2 α -N-oxide, (-)thaligosine-2 α -N-oxide, (+)thaliphylline-2'- β -N-oxide, (+)thalidasine-2 α -N-oxide and (-)5-hydroxythalidasine-2 α -N-oxide - isolated from plant collected from north Pakistan; some N-oxides are possibly formed through oxidation of the corresponding free bases which are already present during isolation process (*J. Nat. Prod.* 1987, 50, 721).

Distribution : Himalayas, from Kashmir to Bhutan, alt. 2400-4200 m.

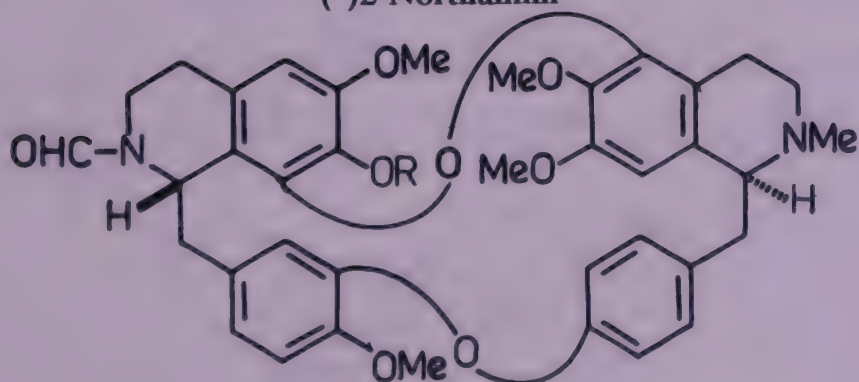
NEW COMPOUNDS



(-)-5-Hydroxythalidasine



(-)-2-Northalmin

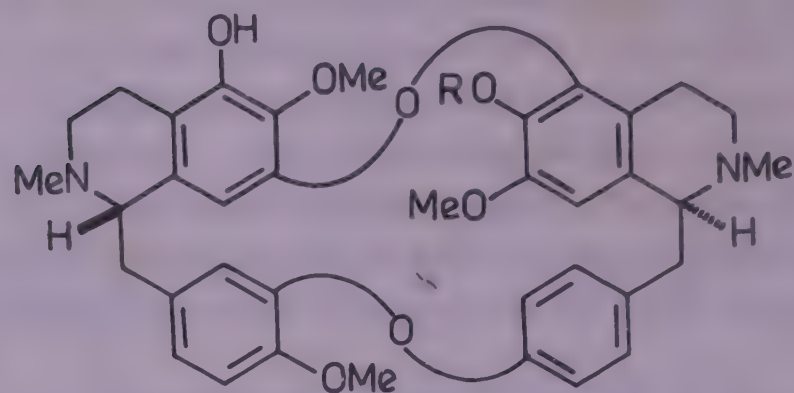


Thalpindione

R = H

Thalrugosinone

R = Me

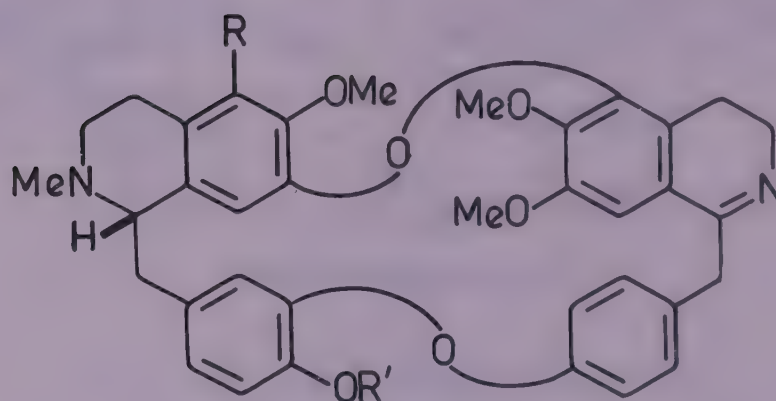


(-)Thalamiculine

R = Me

(-)5-Hydroxythalmine

R = H

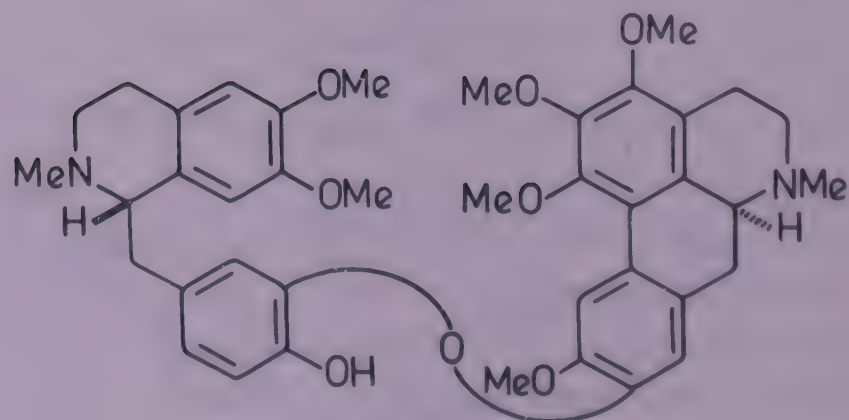


(+)Thalmiculatimine

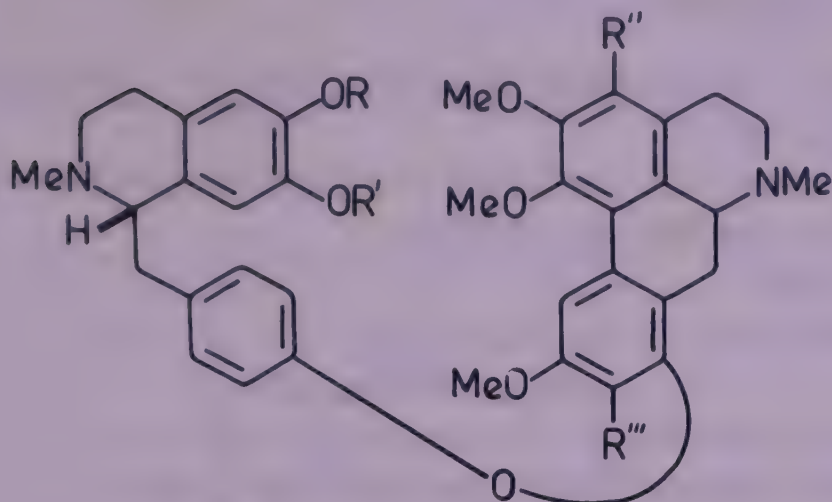
R,R' = H

(-)Thalmiculimine

R = OH, R' = Me



(+)Thalibulamine



(+)Thalifarone

R,R' = Me, R'' = H, R''' = OMe

(+)Thalifaramine

R = Me, R',R'' = H, R''' = OMe

(+)Thalifaretine

R = Me, R' = H, R'',R''' = OMe

(+)Thalifaricine

R = Me, R' = H, R'' = OMe, R''' = OH

(+)Thalifarazine

R = H, R' = Me, R'',R''' = OMe

(+)Thalifaroline

R,R' = Me, R'' = OH, R''' = OMe

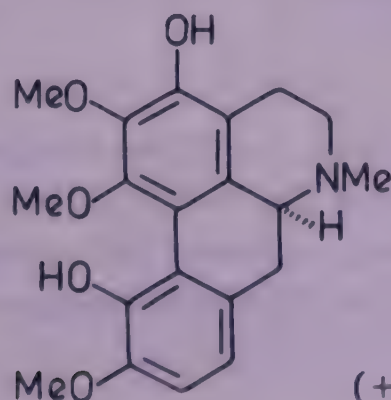
T. javanicum Blume (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 641).

Berberine, oxyberberine, rugosinone, thalifendine, thalisopine and thalrugosaminine isolated from roots (*J. Nat. Prod.* 1985, 48, 669).

T. pedunculatum Edgew. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 412).

A new aporphine alkaloid - (+)N-methyldanguyelline - isolated from plant grown in Pakistan and characterised (*J. Nat. Prod.* 1989, 52, 428).

NEW COMPOUNDS

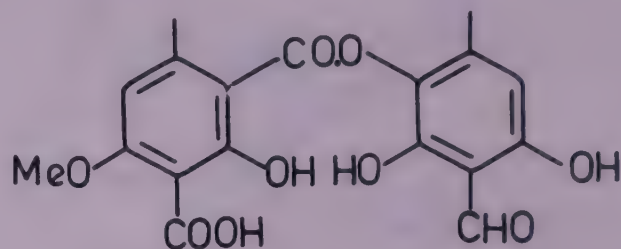


(+)N-Methyldanguyelline

THAMNOLIA (Siphulaceae)

T. vermicularis (Sw.) Ach. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 412).

A new depside - vermicularin - isolated and its structure determined (*Yunnan Zhiwu Yanjiu* 1985, 7, 109; *Chem. Abstr.* 1985, 102, 218351 m).

NEW COMPOUNDS

Vermicularin

BIOLOGICAL ACTIVITY

Vermicularin showed anti-inflammatory and antipyretic activities (*Yunnan Zhiwu Yanjiu* 1985, 7, 109; *Chem. Abstr.* 1985, 102, 218351 m).

THAMNOPTERIS (Aspleniaceae)

T. nidus Presl; see *Asplenium nidus* L.

THEA (Theaceae)

T. sinensis L.; see *Camellia sinensis* (L.) Kuntze

THELYPTERIS (Thelypteridaceae)

T. palustris (Salisb.) Schott syn. *Lastrea thelypteris* sensu Bedd.

2(S)5,7-Dihydroxy-6-methylflavanone-7-O- β -D-glucopyranoside, cryptostrobin (2(S)5,7-dihydroxy-8-methylflavanone), kaempferol-3-O- β -D-glucopyranoside and kaempferol-3-O- β -D-rutinoside isolated from fronds (*Yakugaku Zasshi* 1986, 106, 982; *Chem. Abstr.* 1987, 106, 116491 x).

Distribution : Kashmir and the Nilgiris, alt. 1500-2000 m.

THESPESIA (Malvaceae)

T. populnea (L.) Soland. ex Correa syn. *T. populneoides* Kostel. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 644).

Isolation of alanine, arginine, methionine and tryptophan from seeds (*Pakistan J. Bot.* 1985, 17, 49; *Chem. Abstr.* 1986, 104, 31780 z); lupeol, lupenone and β -sitosterol isolated from

leaves (*Acta Cienc. Indica, Chem.* 1985, 11, 163; *Chem. Abstr.* 1987, 107, 130887 h; *Bangladesh J. Sci. Ind. Res.* 1987, 22, 8; *Chem. Abstr.* 1989, 110, 72517 m).

T. populneoides Kostel.; see *T. populnea* (L.) Soland. ex Correa

THEVETIA (Apocynaceae)

T. neriifolia Juss. ex Steud.; see *T. peruviana* (Pers.) K.Schum.

T. peruviana (Pers.) K.Schum. syn. *T. neriifolia* Juss. ex Steud. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 644).

A polysaccharide isolated from fruits yielded arabinose, galactose, glucose, galacturonic acid and xylose (*Bangladesh J. Sci. Ind. Res.* 1984, 19, 177; *Chem. Abstr.* 1986, 104, 221984 s).

BIOLOGICAL ACTIVITY

Cardiotonic effect against pentobarbital-induced heart failure and therapeutic and toxic blood concentrations of thevetin, neriifolin, peruvoside and its 2'-monoacetate were compared with those of digitalis preparation in guinea pigs. Peruvoside showed the strongest cardiotonic effect and the highest therapeutic activity (*Zhonghua Xinxueguanbing Zazhi* 1988, 16, 161; *Chem. Abstr.* 1989, 110, 69129 f).

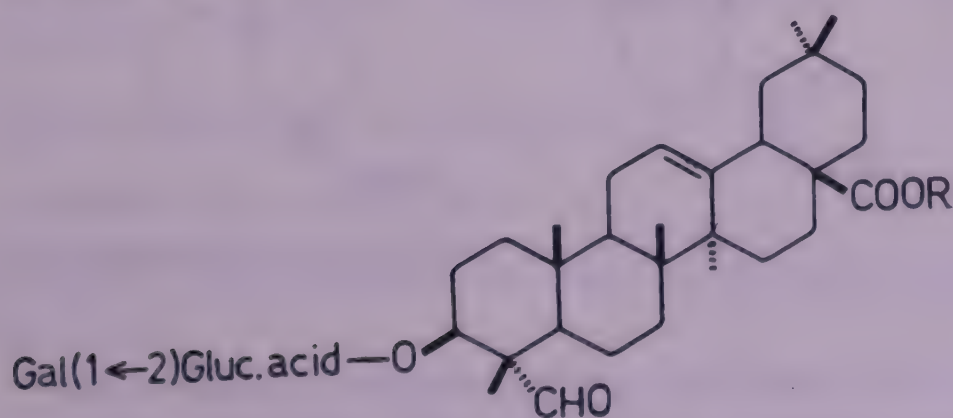
THLADIANTHA (Cucurbitaceae)

T. hookeri Clarke var. *irregularis* Chakravarty syn. *T. hookeri* Clarke var. *pentadactyla* (Cogn.) Lu & Zhang

A new triterpenoid saponin - thladioside H1 - isolated from tubers and characterised as β -xylopyranosyl(1 \rightarrow 3) β -xylopyranosyl(1 \rightarrow 4)- α -rhamnopyranosyl(1 \rightarrow 2)- β -xylopyranosyl ester of 3-O- β -D-galactopyranosyl(1 \rightarrow 2)- β -glucuronopyranosyl gypsogenin (*Phytochemistry* 1989, 28, 1711).

Distribution : Assam, Manipur, Meghalaya and Nagaland.

NEW COMPOUNDS



Thladioside H1

R = Xyl(2 \rightarrow 1)Rha(4 \rightarrow 1)Xyl(3 \rightarrow 1)Xyl

T. hookeri Clarke var. *pentadactyla* (Cogn.) Lu & Zhang; see *T. hookeri* Clarke var. *irregularis* Chakravarty

THUJA (Cupressaceae)

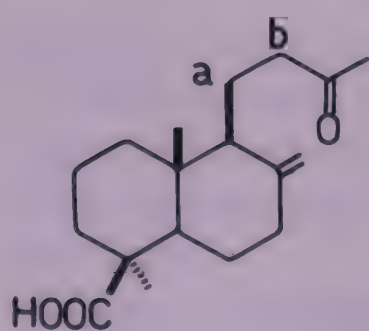
T. gigantea Nutt.; see *T. plicata* D. Don

T. japonica Maxim.; see *T. standishii* Carr.

T. orientalis L. syn. *Biota orientalis* Endl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 645).

α -Cuparenone synthesised (*Indian J. Chem.* 1984, 23B, 1054); isolation of apigenin, cupressuflavone, quercitrin, kaempferol-7-O-glucoside, myricetin-3-O- α -L-rhamnoside and quercetin-7-O-rhamnoside from leaves (*Curr. Sci.* 1985, 54, 1180); (+)catechin, (-)epicatechin, procyanidin B1 and procyanidin B3 isolated from unripe cones (*Istanbul Univ. Eczacilik Fak. Mecm.* 1985, 21, 80; *Chem. Abstr.* 1987, 107, 93489 g); quercitrin isolated (*Chem. Pharm. Bull.* 1985, 33, 206); leaves afforded deoxypodophyllotoxin and ethyl p-methoxy-trans-cinnamate (*Chem. Pharm. Bull.* 1985, 33, 5565); four labdane type diterpenoids - 15,16-bisnor-13-oxo-8(17)-labden-19-oic acid (I), 15,16-bisnor-13-oxo-8(17),11E-labdadien-19-oic acid (II), 14,15,16-trisnor-8(17)-labdene-13,19-dioic acid (III) and 12(R),13-dihydroxycommunic acid - isolated from seeds and their structures elucidated (*Phytochemistry* 1985, 24, 1602); isolation and structure determination of 16-feruloxypalmitic acid and 5-O-p-coumaroylquinic acid methyl ester from pollen grains; p-coumaric acid, ferulic acid, epi-ikshusterol, luteolin, populnin, quercetin and β -sitosteryl- β -D-glucoside also isolated (*Chem. Pharm. Bull.* 1988, 36, 807).

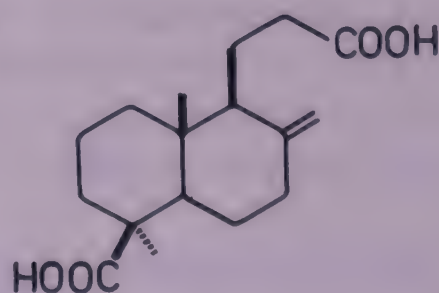
NEW COMPOUNDS



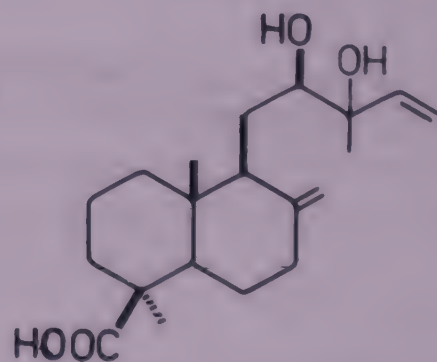
I

II

ab = Δ



III



12(R),13-Dihydroxycommunic acid

BIOLOGICAL ACTIVITY

Quercitrin showed haemostatic activity in mice (*Chem. Pharm. Bull.* 1985, 33, 206); deoxypodophyllotoxin and ethyl p-methoxy-trans-cinnamate showed cytotoxic activity against HeLa cells (*Chem. Pharm. Bull.* 1985, 33, 5565).

T. plicata D.Don syn. *T. gigantea* Nutt.

Eng. - Giant arbor-vitae, Western red-cedar

Hinokiflavone, amentoflavone, 7-O-methylamentoflavone, 7,7''-di-O-methylamentoflavone and 7,4',4'''-tri-O-methylamentoflavone isolated (*J. Indian Chem. Soc.* 1987, 64, 514).

Distribution : Native of North-west America and introduced in Himachal Pradesh, Punjab, West Bengal and Government Botanic Garden, Ooty (India), alt. 1200-2500 m.

T. standishii Carr. syn. *T. japonica* Maxim. (*javanica*)

Eng. - Japanese arbor-vitae.

Hinokiflavone, amentoflavone, 7-O-methylamentoflavone, 7,7''-di-O-methylamentoflavone and 7,4',4'''-tri-O-methylamentoflavone isolated (*J. Indian Chem. Soc.* 1987, 64, 514).

Distribution : Indigenous to Japan, grown in Government Botanic Garden, Ooty.

THYMUS (Lamiaceae)

T. linearis Benth. syn. *T. serpyllum* auct. (non L), *T. quinquecostatus* Celak (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 645).

Thymol (19.1-64.6), p-cymene (9.1-46.9) and carvacrol (1.9-5.0%) determined in essential oil of leaves and flowers collected from three areas of India (*Parfuem. Kosmet.* 1985, 66, 609; *Chem. Abstr.* 1986, 104, 10352 w); apigenin-4'-O- β -D-(6''-p-coumaroyl)glucoside isolated from stems (*J. Inst. Chemists*, Calcutta 1985, 57, 153; *Chem. Abstr.* 1986, 104, 145503 s); isolation of scutellarein-7-O- β -D-glucopyranosyl(1 \rightarrow 4)-O- α -L-rhamnopyranoside from stems (*J. Indian Chem. Soc.* 1986, 63, 226); linalool, carvacrol and geranyl acetate present in essential oil of aerial parts (*Flavour Fragrance J.* 1988, 3, 73; *Chem. Abstr.* 1988, 109, 226737 b).

T. quinquecostatus Celak; see *T. linearis* Benth.

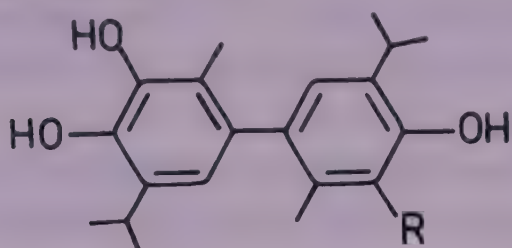
T. serpyllum L.; see *T. linearis* Benth.

T. vulgaris L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 645).

Carvacrol and thymol found to be present in essential oil by HPLC (*Acta Pharm. Indones.* 1985, 10, 111; *Chem. Abstr.* 1987, 106, 72681 c); two biphenyls isolated from roots and characterised as 3,4,3',4'-tetrahydroxy-5,5'-diisopropyl-2,2'-dimethylbiphenyl (I) and 3,4,4'-tri-

hydroxy-5,5'-diisopropyl-2,2'-dimethylbiphenyl (II) (*Chem. Pharm. Bull.* 1989, 37, 1816); isolation of three biphenyls - 4'-hydroxy-5,5'-diisopropyl-2,2'-dimethylbiphenyl-3,4-dione (III), 5,5'-diisopropyl-2,2'-dimethylbiphenyl-3,4,3',4'-tetraone (IV) and 4,4'-dihydroxy-5,5'-diisopropyl-2,2'-dimethylbiphenyl-3,6-dione (V) from leaves and their characterisation (*Agric. Biol. Chem.* 1989, 53, 1375).

NEW COMPOUNDS

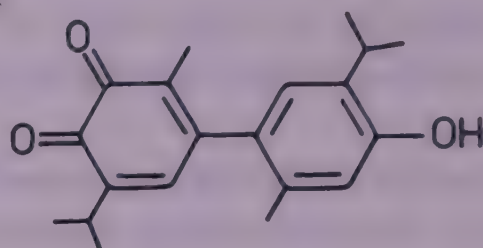


I

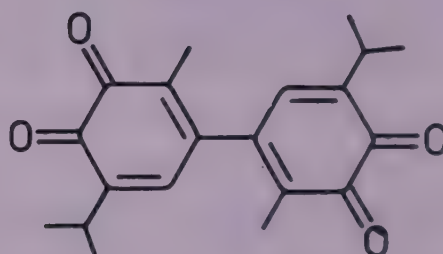
R = OH

II

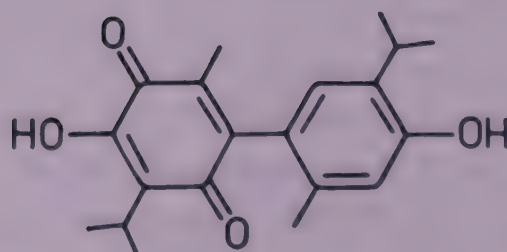
R = H



III



IV



V

TIBOUCHINA (Melastomataceae)

T. semidecandra Cogn.

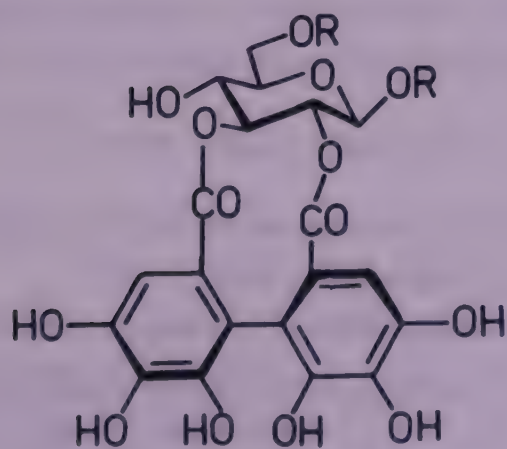
New ellagitannin oligomers - nobotanins A, B and F - and monomer - nobotanin D - isolated and their structures determined (*Chem. Pharm. Bull.* 1986, 34, 2676); structure of nobotanin B revised (*Heterocycles* 1987, 26, 2845).

Distribution : Native of America, introduced into hill stations of India, now naturalised.

NEW COMPOUNDS

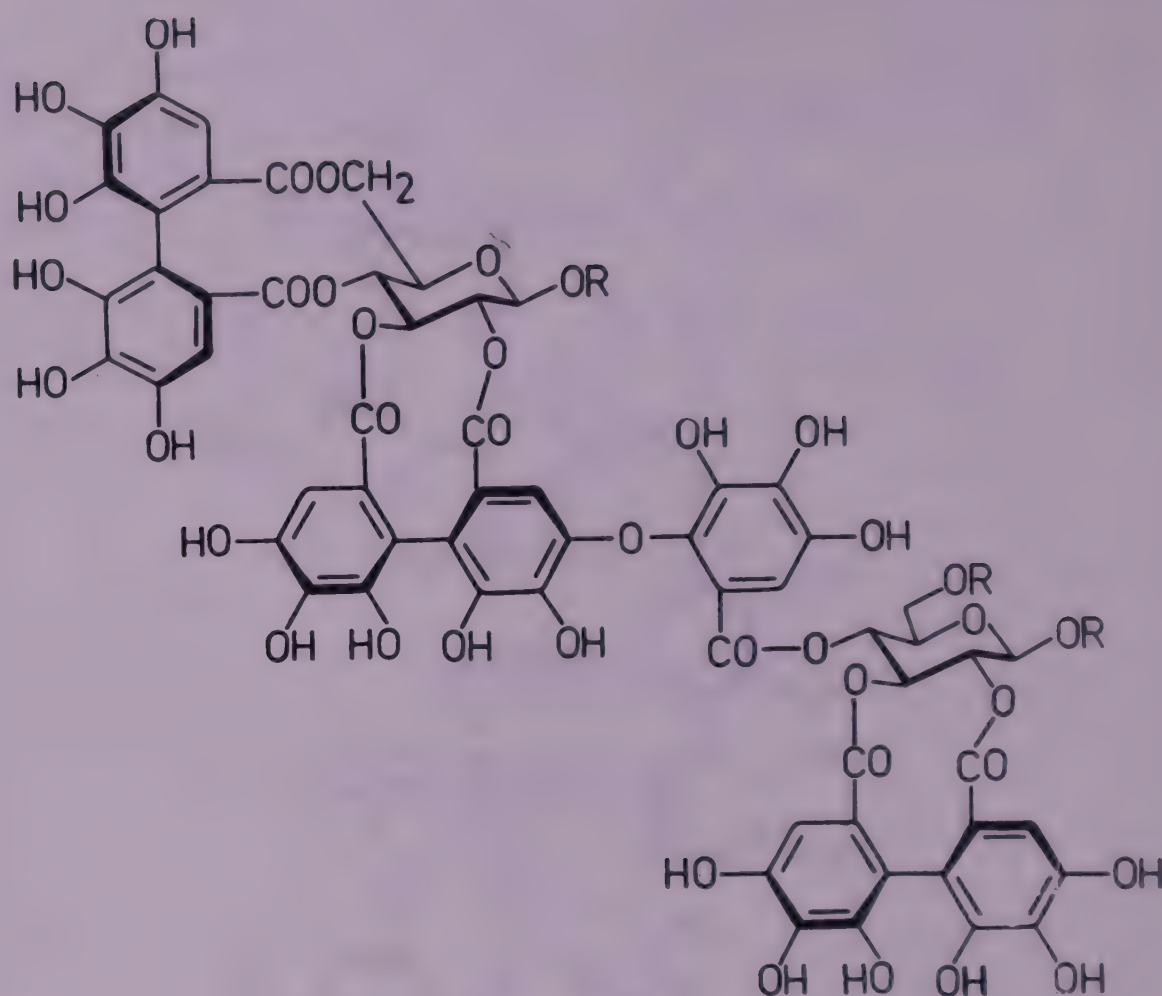

$$R = \text{Galloyl}, R' = H$$

Nobotanin F

$$R, R' = \text{Galloyl}$$


Nobotanin D

R = Galloyl



Nobotanin B
R = Galloyl

TILIACORA (Menispermaceae)

T. acuminata (Lamk.) Miers syn. *T. racemosa* Colebr. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 646).

Isolation and structure elucidation of a new diphenylbisbenzylisoquinoline alkaloid - N-methyltiliamosine - from leaves (*Phytochemistry* 1989, 28, 675).

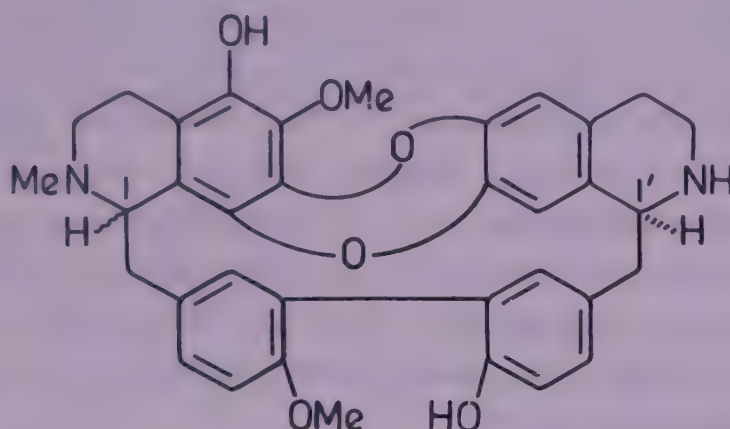
T. racemosa Colebr.; see *T. acuminata* (Lamk.) Miers

T. triandra (Colebr.) Diels syn. *Aristega laevifolia* Miers (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 646).

A new bisbenzylisoquinoline alkaloid - yanangcorinine - isolated and its structure determined; tiliacorinine, nortiliacorinine A and tiliacorine also isolated (*Arch. Pharm.* 1986, 319, 126; *Chem. Abstr.* 1986, 105, 3513 s); isolation and structure elucidation of another bisbenzylisoquinoline alkaloid - tilianangine (*Arch. Pharm.* 1986, 319, 872; *Chem. Abstr.* 1987, 106, 15735 z); isolation of a new (1S,1'S)bisbenzylisoquinoline alkaloid - yanangine - along with

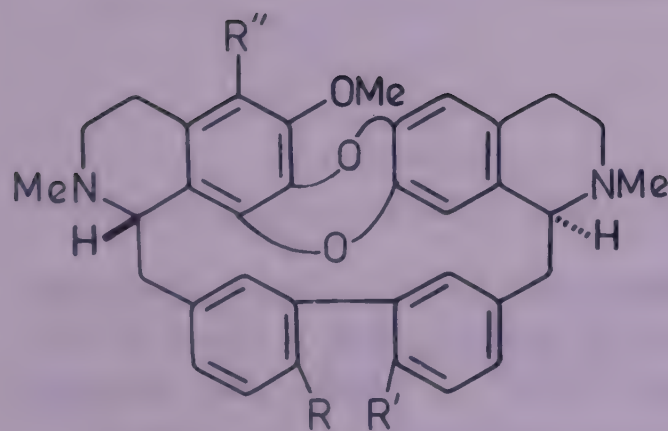
(1R,1'S)dinklacorine and its structure determination (*Arch. Pharm.* 1986, 319, 841; *Chem. Abstr.* 1987, 106, 29999 a); another two new bisbenzylisoquinoline alkaloids - noryanangine and norisoyanangine - along with magnoflorine, nortiliacorine A and tiliacorinine-2' N-oxide isolated from aerial parts and structures of new compounds elucidated (*Planta Med.* 1988, 54, 433); a new alkaloid - tilitriandrine - obtained from aerial parts and its structure determined; (1S,1'R)tiliagine and protoquercitol also isolated (*Planta Med.* 1988, 54, 516).

NEW COMPOUNDS



Noryanangine (1S,1'S)

Norisoyanangine (1R,1'S)



Yanangcorinine

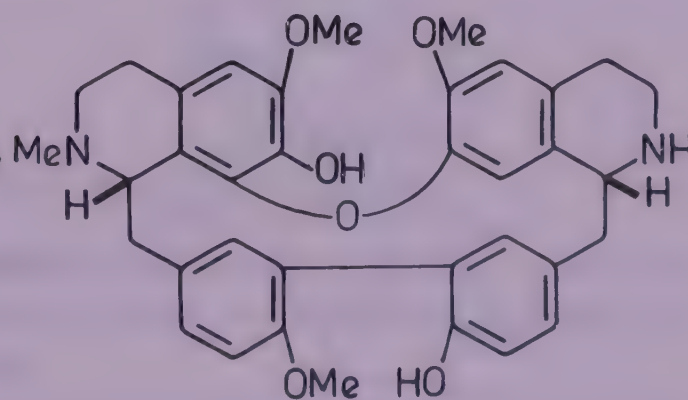
R = OH, R' = OMe, R'' = H

Yanangine

R = OMe, R', R'' = OH

Tilianangine

R, R'' = OH, R' = OMe



Tilitriandrine

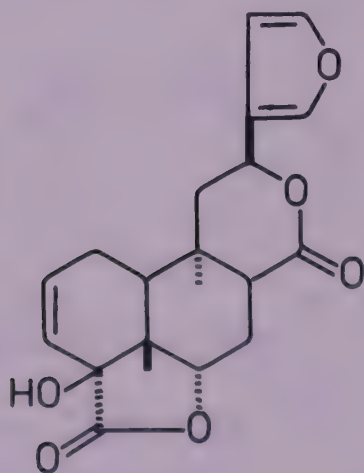
TINOSPORA (Menispermaceae)

T. cordifolia (Willd.) Miers ex Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 646).

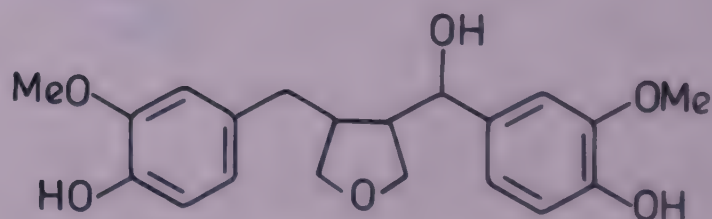
Stem extract significantly decreased bronchospasm induced by 5.0% histamine aerosol in guinea pig and capillary permeability in mice. It also reduced the number of disrupted mast cells in rats (*Indian J. Pharmacol.* 1986, 18, 250).

A new 1,2-substituted pyrrolidine isolated (*Indian Drugs* 1985, 23, 119); a new diterpenoid furanolactone (I) isolated from stems and its structure elucidated (*Phytochemistry* 1986, 25, 1677); a new phenolic lignan isolated and characterised as 3-(α ,4-dihydroxy-3-methoxybenzyl)4-(4-hydroxy-3-methoxybenzyl)tetrahydrofuran (II); nonacosan-15-one, octacosanol and β -sitosterol also isolated (*J. Chem. Soc. Perkin 1* 1986, 1181); a new clerodane diterpenoid (III) isolated and its structure established by X-ray studies as (5R,10R)4R,8R-dihydroxy-2S,3R:15,16-diepoxycleroda-13(16,14)-dieno-17,12S:18,1S-dilactone (*Phytochemistry* 1988, 27, 1212; *Acta Crystallogr., Cryst. Struct. Commun.* 1988, 44C, 1421; *Chem. Abstr.* 1989, 110, 21057 d); a new clerodanefuranoditerpene (IV) isolated from stems and characterised as C-6,C-12 epimer of 6-hydroxyarcangelicin (*J. Nat. Prod.* 1988, 51, 197); isolation of a new 18-norclerodane glucoside - tinosporaside - from stem wood and its characterisation as 1,17-dioxo-8 β ,10 α ,12 α ,19 α ,20 β -18-norclerod-2,13(16),14-trien-4 α -glucopyranosyl-12,17:15,16-dioxide (*Phytochemistry* 1989, 28, 273).

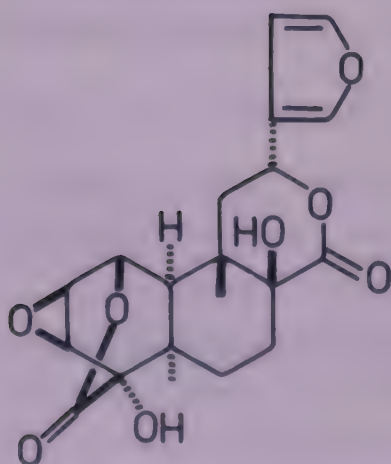
NEW COMPOUNDS



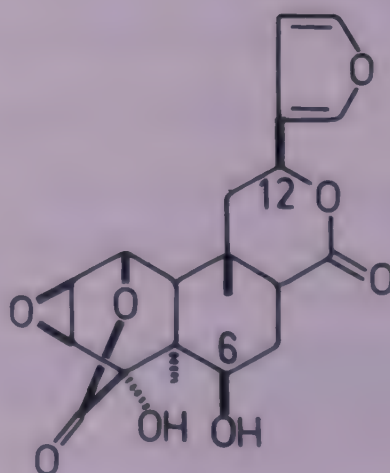
I



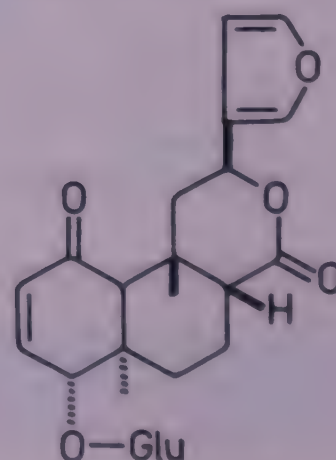
II



III



IV



Tinosporaside

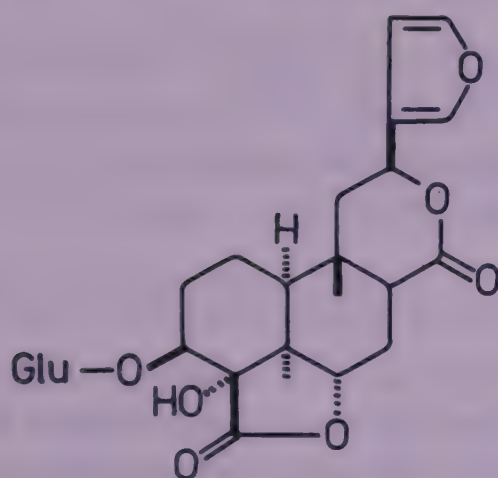
BIOLOGICAL ACTIVITY

1,2-Substituted pyrrolidine showed central nervous system depressant and hypoglycaemic activities (*Indian Drugs* 1985, 23, 119).

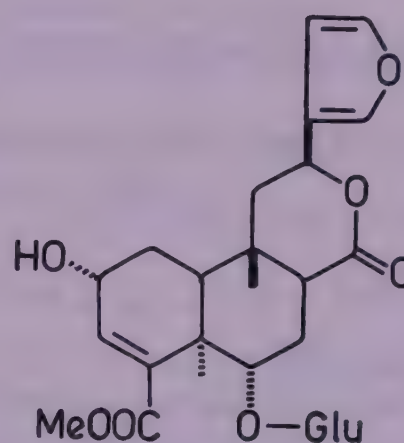
T. crisa (L.) Hook.f. & Thoms. syn. *T. tuberculata* (Lamk.) Beumee ex K. Heyne (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 647).

A new diterpene glucoside - borapetoside A - and its aglycone - borapetol A - isolated from stems and their structures elucidated (*Chem. Pharm. Bull.* 1985, 33, 4438); isolation of another diterpene glucoside - borapetoside B - and its aglycone - borapetol B - from stems and their structure determination (*Chem. Pharm. Bull.* 1986, 34, 2868).

NEW COMPOUNDS



Borapetoside A



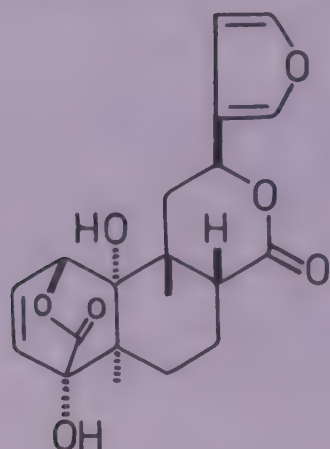
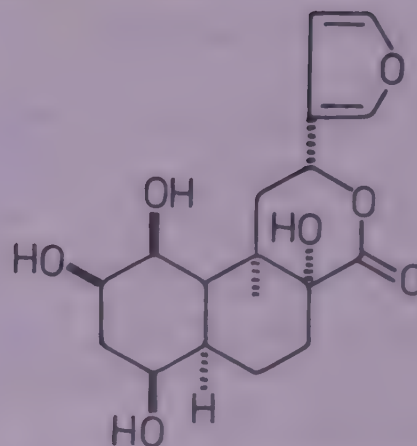
Borapetoside B

T. malabarica (Lamk.) Hook.f. & Thoms.; see *T. sinensis* (Lour.) Merrill

T. sinensis (Lour.) Merrill syn. *T. malabarica* (Lamk.) Hook.f. & Thoms., *T. tomentosa* (Colebr.) Hook.f. & Thoms. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 647).

Isolation of kokusaginine (*Planta Med.* 1985, 51, 529); isolation and ¹³C-NMR studies of N-formylanonaine and di-O-methylsyngaresinol (*Fitoterapia* 1987, 58, 266); a new bisnor-diterpenoid - malabarolide - isolated from stems and its crystal structure elucidated (*Tetrahedron Lett.* 1988, 29, 4241); isolation of a new furanoid diterpene - 10 α -hydroxycolumbin - from stems and its structure determination (*Phytochemistry* 1988, 27, 1882).

NEW COMPOUNDS

10 α -Hydroxycolumbin

Malabarolide

T. tomentosa (Colebr.) Hook.f. & Thoms.; see *T. sinensis* (Lour.) Merrill

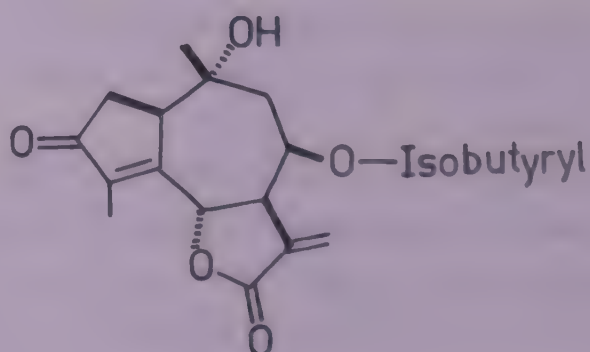
T. tuberculata (Lamk.) Beumee ex K.Heyne; see *T. crispa* (L.) Hook.f. & Thoms.

TITHONIA (Asteraceae)

T. diversifolia A. Gray (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 648).

Absolute stereochemistry of tagitinin A determined by X-ray diffraction studies which confirmed α -orientation of Me at C4 (*Phytochemistry* 1987, 26, 2406); absolute stereochemistry of cyclotagitinin C confirmed (*Indian J. Chem.* 1988, 27B, 324).

NEW COMPOUNDS



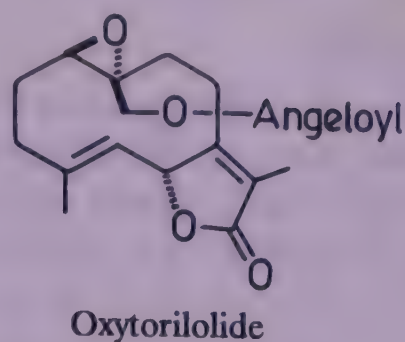
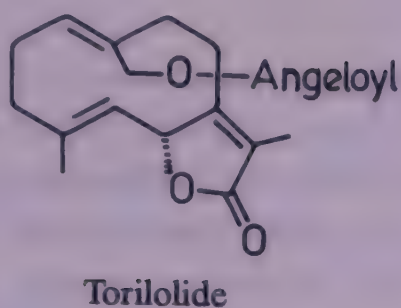
Cyclotagitinin C

TORILIS (Apiaceae)

T. japonica (Houtt.) DC. syn. *Caucalis anthriscus* (L.) Clarke (non Scop.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 651).

Two novel germacranolides - torilolide and oxytorilolide - isolated and their crystal structures established (*Chem. Pharm. Bull.* 1986, 34, 4682).

NEW COMPOUNDS



TRACHYCARPUS (Arecaceae)

T. excelsa Wendl.; see *T. fortunei* (Hook.) Wendl.

T. fortunei (Hook.) Wendl. syn. *T. excelsa* Wendl. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 652).

5-Hydroxypipecolic acid, asparagine and γ -aminobutyric acid identified in flowers (*Shoyakugaku Zasshi* 1984, 38, 355; *Chem. Abstr.* 1985, 103, 109826 v).

TRACHYSPERMUM (Apiaceae)

T. ammi (L.) Sprague syn. *Carum copticum* Benth. & Hook. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 652).

A new phenolic galactoside - 3-galactosyloxy-5-hydroxytoluene - isolated from seeds along with galactose, β -methylgalactoside and 2-methyl-3-glucosyloxy-5-isopropylphenol (*Proc. Natl. Acad. Sci. India* 1985, 55, 95; *Chem. Abstr.* 1986, 105, 57919 x).

T. anethifolium (D.Don) Wolff syn. *Carum anethifolium* (D.Don) Clarke

p-Cymene, β -phellandrene, γ -terpinene as major components along with trans- β -bergamotene, trans-bergamota-2,12-dien-14-ol, β -bisabolene, borneol, carveol, cedrene, cuparene, dihydrocarvone, dihydrocuminyl alcohol, β -eudesmol, α -fenchene, α -humulene, limonene, myrcene, myrtenol, β -ocimene, α -phellandrene and thymol identified in essential oil by GC-MS (*J. Indian Chem. Soc.* 1984, 61, 895).

Distribution : Himalayas from Kumaon to Bhutan, alt. 900-1500 m.

TRADESCANTIA (Commelinaceae)

T. virginiana L.

Cycloartanol, octacosan-1-ol, β -sitosterol acetate, palmitic acid and phytol found to be present in aerial parts (*Pharmazie* 1989, 44, 165; *Chem. Abstr.* 1989, 111, 74795 v).

Distribution : Grown in Indian gardens.

TRAGOPOGON (Asteraceae)*T. orientalis* L.

β -Amyrin, cholesterol, hexacosanol, lupeol, β -sitosterol, stigmasterol and n-triacontane identified (*Acta Soc. Bot. Pol.* 1988, 57, 85; *Chem. Abstr.* 1989, 111, 191502 h); apigenin, luteolin, isoorientin, orientin, quercetin, vitexin and acetic, caffeic, chlorogenic, p-coumaric, ferulic, gentisic, p- and m-hydroxybenzoic, o- and p-hydroxyphenylacetic, homoprotocatechuic, protococatechuic, salicylic and vanillic acids and fructose, glucose, sucrose and glycosides of apigenin, luteolin and quercetin isolated (*Acta Soc. Bot. Pol.* 1988, 57, 93; *Chem. Abstr.* 1989, 111, 191503 j).

Distribution : Ladakh, alt. 3000-4000 m.

TRAPA (Onagraceae)

T. bispinosa Roxb.; see *T. natans* L. var. *bispinosa* (Roxb.) Makino

T. natans L. var. *bispinosa* (Roxb.) Makino syn. *T. bispinosa* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 653).

Gallic acid isolated from fruits (*Yakugaku Zasshi* 1986, 106, 183; *Chem. Abstr.* 1986, 104, 213083 g).

BIOLOGICAL ACTIVITY

Gallic acid showed inhibitory activity against HeLa cells (*Yakugaku Zasshi* 1986, 106, 183; *Chem. Abstr.* 1986, 104, 213083 g).

TRIADENUM (Hypericaceae)

T. japonicum (Blume) Makino; see *Hypericum japonicum* Thunb. ex Murr.

TRIBULUS (Zygophyllaceae)

T. terrestris L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 655).

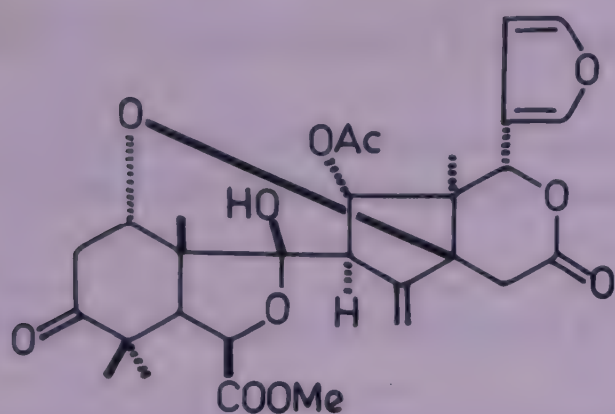
Isolation of kaempferol and quercetin from fruits and stems (*Indian J. Nat. Prod.* 1987, 3(2), 17; *Chem. Abstr.* 1988, 109, 70364 q).

TRICHILIA (Meliaceae)

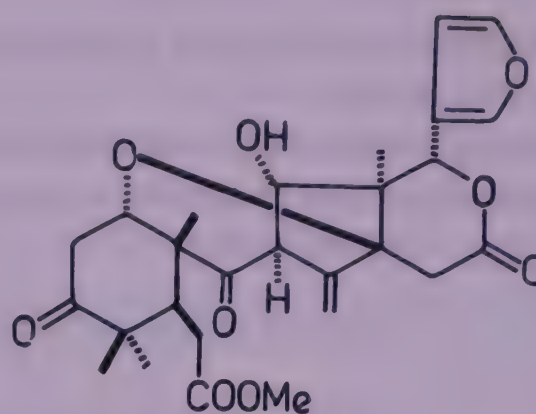
T. connaroides (Wt. & Arn.) Bentvelzen syn. *Heynea trijuga* Roxb. ex Sims (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 656).

Two new tetranortriterpenoids - trijugins A and B - isolated from leaves and their structures elucidated (*Can. J. Chem.* 1987, 65, 35).

NEW COMPOUNDS



Trijugin A



Trijugin B

TRICHOLEPSIS (Asteraceae)

T. procumbens Wt.; see *Amberboa ramosa* (Roxb.) Jafri

TRICHOSANTHES (Cucurbitaceae)

T. bracteata (Lam.) Voigt; see *T. tricuspidata* Lour.

T. dioica Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 248).

Seed extract lowered blood sugar, serum cholesterol and triglycerides and increased the levels of phospholipids and HDL- cholesterol in rabbits (*Indian J. Med. Res.* 1988, 87, 398).

T. tricuspidata Lour. syn. *T. bracteata* (Lam.) Voigt (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 657).

Isolation of cucurbitacins B and D and bryonolic acid from roots (*Yakugaku Zasshi* 1989, 109, 265; *Chem. Abstr.* 1989, 111, 28405 v).

TRIDAX (Asteraceae)

T. procumbens L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 658).

Isolation of methyl 14-oxooctadecanoate, methyl 14-oxononacosanoate, 3-methyl-nonadecylbenzene, heptacosanycyclohexane carboxylate, 1-(2,2-dimethyl-3-hydroxypropyl) isobutyl phthalate, 12-hydroxytetracosan-15-one, 32-methyl-30-oxotetratriacont-31-en-1-ol and 30-methyl-28-oxodotriacont-29-en-1-oic acid along with β -amyrin, β -amyrone, fucosterol, lupeol and sitosterol (*Phytochemistry* 1988, 27, 459); arachidic, behenic, lauric, linoleic, linolenic, myristic, palmitic, palmitoleic and stearic acids isolated (*Indian J. Pharm. Sci.* 1988, 50, 168).

TRIFOLIUM (Papilionaceae)

T. alexandrinum L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 685).

Kaempferol and velutin isolated (*J. Indian Chem. Soc.* 1986, 63, 854); isolation of caproic, lauric, linolenic, oleic and palmitoleic acids from seeds (*Egypt. J. Pharm. Sci.* 1986, 27, 79; *Chem. Abstr.* 1987, 106, 210997 p).

T. pratense L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 658).

Soyasapogenols B, C, D, E and F and arabinose, glucose, glucuronic acid, rhamnose and xylose obtained by acid hydrolysis of saponins from roots (*Acta Soc. Bot. Pol.* 1986, 55, 247; *Chem. Abstr.* 1987, 106, 30074 b); a new flavone glycoside isolated and characterised as 3-methoxyquercetin-7-O- β -D-glucopyranoside (*Natl. Acad. Sci. Lett.* 1986, 9, 379); isolation of a new calycosin glycoside - 7,3'-dihydroxy-4'-methoxyisoflavone-7-O- β -D-galactopyranoside (*Fitoterapia* 1987, 58, 262); a new pterocarpan glycoside - maackianin-3-O- β -D-galactopyranoside - obtained from roots and its structure elucidated (*J. Indian Chem. Soc.* 1988, 65, 69).

TRIGONELLA (Papilionaceae)

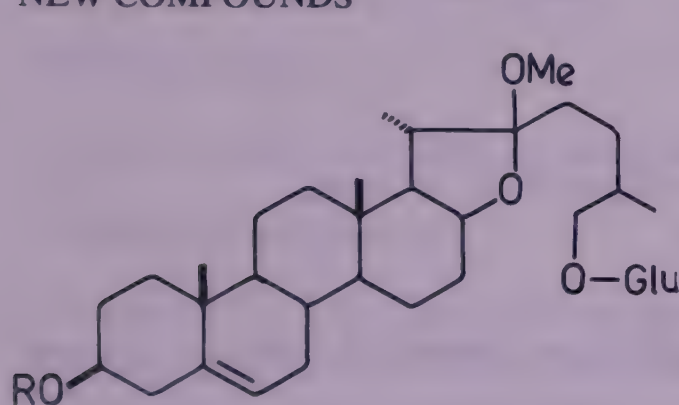
T. foenum-graecum L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 659).

Seeds extract exhibited mild anti-implantation activity (about 30.0%) in rats when administered orally in single dose (25.0 mg/kg) from day 1 to day 10 of pregnancy. Average number of foetal implants was also significantly affected (*Arogya* 1983, 9, 91).

Two new furostanol glycosides isolated as their methyl ethers - trigofoenosides A-1 and D-1 - from seeds and characterised as 25(S)22-O-methylfurost-5-en-3 β ,26-diol-3-O- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-glucopyranosyl-26-O- β -D-glucopyranoside and 25(S)22-O-methylfurost-5-en-3 β ,26-diol-3-O- α -L-rhamnopyranosyl(1 \rightarrow 2)[β -D-glucopyranosyl(1 \rightarrow 3)]- β -D-glucopyranosyl-26-O- β -D-glucopyranoside respectively (*Phytochemistry* 1985, 24, 2399); isolation of another two furostanol glycosides as their methyl ethers - trigofoenosides B-1 and C-1 - from seeds and their characterisation as 25(S)22-O-methyl-5 α -furostane-2 α ,3 β ,26-triol-3-O- α -L-rhamnopyranosyl(1 \rightarrow 4)- β -D-glucopyranosyl-26-O- β -D-glucopyranoside and 25(R)22-O-methyl-5 α -furostane-2 α ,3 β ,26-triol-3-O- α -L-rhamnopyranosyl(1 \rightarrow 4)[α -L-rhamnopyranosyl(1 \rightarrow 2)]- β -D-glucopyranosyl-26-O- β -D-glucopyranoside respectively (*Phytochemistry* 1986, 25, 2205); a new furostanol saponin - trigofoenoside E-1 - isolated from seeds and its structure elucidated (*Indian J. Chem.* 1985, 24B, 1215); two new furostanol glycosides isolated from seeds as methyl ethers - trigofoenosides F-1 and G-1 - and characterised as 25

(R)22-O-methylfurost-5-en-3 β ,22,26-triol-3-O- α -L-rhamnopyranosyl(1 \rightarrow 2)- β -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranosyl-26-O- β -D-glucopyranoside and 25(R)22-O-methylfurost-5-en-3 β ,22,26-triol-3-O- α -L-rhamnopyranosyl(1 \rightarrow 2)[β -D-xylopyranosyl(1 \rightarrow 4)]- β -D-glucopyranosyl(1 \rightarrow 6)- β -D-glucopyranosyl-26-O- β -D-glucopyranoside respectively (*Phytochemistry* 1984, 23, 2605); diosgenin, gitogenin, neotigogenin, neogitogenin, sarsasapogenin, smilagenin, tigogenin and yamogenin isolated from seeds (*J. Nat. Prod.* 1986, 49, 1153); a new flavone - trigraecum - isolated and its structure determined and confirmed by synthesis (*Proc. Indian Natl. Sci. Acad.* 1987, 53A, 463; *ibid.* 1988, 54A, 638); a process developed for isolation of diosgenin, gitogenin, yamogenin and 25 α -spirosta-3,5-diene from seeds of Egyptian plant (*Alexandria J. Pharm. Sci.* 1988, 2, 35; *Chem. Abstr.* 1989, 11, 82342 q); cholest-5-en-3 β -ol and its 24 ξ -ethyl and 24 ξ -methyl derivatives, 5 α -cholest-7-en-3 β -ol, 14 α -methylcholesten-3 β -ol and 14 α -methyl-9,19-cyclo-5 α -cholestan-3 β -ol identified in essential oil (*Rev. Fr. Corps Gras* 1988, 35, 435; *Chem. Abstr.* 1989, 111, 130702 b).

NEW COMPOUNDS



Trigofenoside A-1

R = Glu(2 \rightarrow 1)Rha

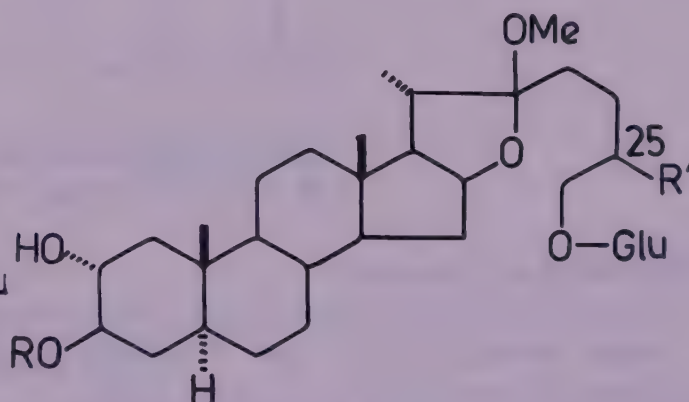
Trigofenoside D-1

R = Glu[(2 \rightarrow 1)Rha](3 \rightarrow 1)Glu

Trigofenoside F-1

R = Glu(6 \rightarrow 1)Glu(2 \rightarrow 1)Rha

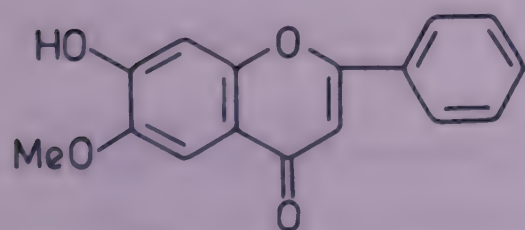
Trigofenoside G-1

R = Glu(6 \rightarrow 1)Glu[(2 \rightarrow 1)Rha](4 \rightarrow 1)Xyl

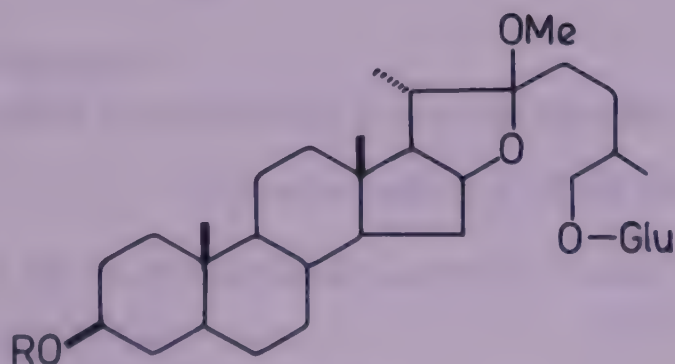
Trigofenoside B-1

R = Glu(4 \rightarrow 1)Rha, R' = α -Me

Trigofenoside C-1

R = Glu[(2 \rightarrow 1)Rha](4 \rightarrow 1)Rha, R' = β -Me

Trigraecum



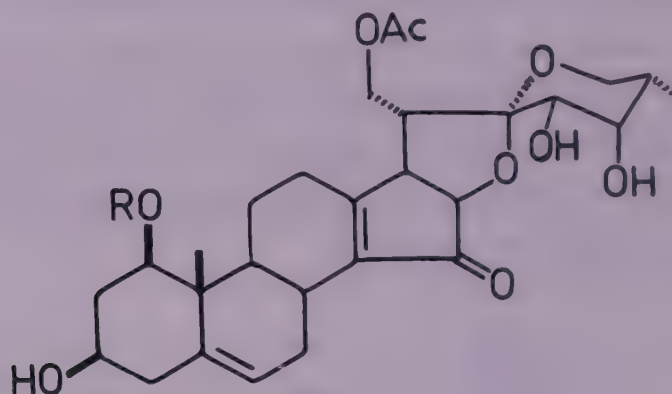
Trigofenoside E-1

R = Glu[(2 \rightarrow 1)Rha](4 \rightarrow 1)Xyl

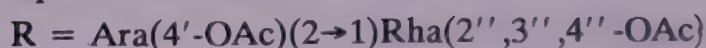
TRILLIUM (Trilliaceae)

T. tschonoskii Maxim. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 660).

A new 18-norspirostanol glycoside - epitrillenoside CA - isolated from aerial parts and characterised as 1-O-[2'',3'',4''-tri-O-acetyl- α -L-rhamnopyranosyl(1 \rightarrow 2)-4'-O-acetyl- α -L-arabinopyranosyl]-21-O-acetylepitrillenogenin (*Phytochemistry* 1986, 25, 544).

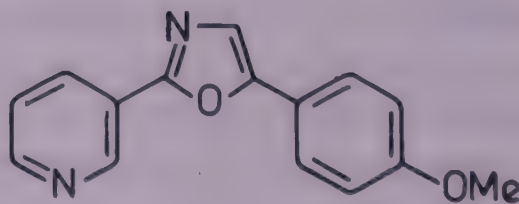
NEW COMPOUNDS

Epitrillenoside CA

**TRIPHASIA** (Rutaceae)

T. trifolia (Burm.f.) P.Wils. syn. *T. trifoliata* DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 661).

Methylhalfordinol isolated from aerial parts (*Rev. Cubana Quim.* 1986, 2, 22; *Chem. Abstr.* 1988, 109, 20246 g).

NEW COMPOUNDS

Methylhalfordinol

T. trifoliata DC.; see *T. trifolia* (Burm.f.) P.Wils.

TROPAEOLUM (Tropaeolaceae)

T. majus L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 422).

Erucic (50.9) and eicosenoic (25.3%) acids determined in seed oil; cis-11-eicosenoic acid separated by HPLC (*Herba Hung.* 1986, 25, 129; *Chem. Abstr.* 1987, 106, 210969 f).

T. minus L.

Eng. - Dwarf nasturtium.

Determination of erucic (43.0), oleic (30.6) and eicosenoic (14.5%) acids in seed oil (*Herba Hung.* 1986, 25, 129; *Chem. Abstr.* 1987, 106, 210969 f).

Distribution : Native of South America, introduced into Indian gardens.

T. peregrinum L.

Eng. - Canary creeper, canarybird flower.

Erucic (44.4), oleic (27.9) and eicosenoic (18.3%) acids determined in seed oil (*Herba Hung.* 1986, 25, 129; *Chem. Abstr.* 1987, 106, 210969 f).

Distribution : Native of South America, introduced into India in gardens, has also run wild in hilly regions of India.

TUPISTRA (Liliaceae)

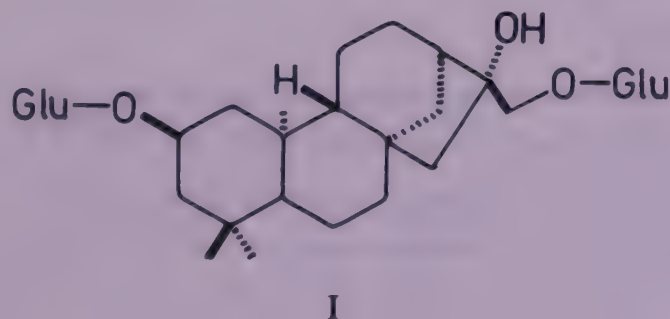
T. aurantiaca Wall. ex Hook.f.; see *Campylandra aurantiaca* Baker

TURBINA (Convolvulaceae)

T. corymbosa (L.) Rafin. syn. *Rivea corymbosa* Haill. f. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 423).

Isolation of a new diterpene diglucoside (I) from seeds and its structure determination (*J. Chem. Res., Synop.* 1987, 318; *Chem. Abstr.* 1988, 108, 218947 j).

NEW COMPOUNDS



TURRAEA (Meliaceae)

T. obtusifolia Hochst.

Eng. - Starbush.

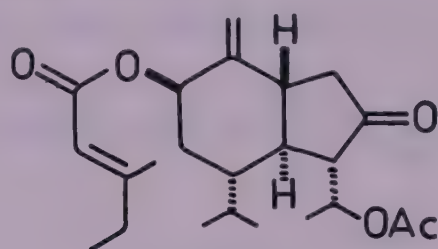
Prieurianin isolated (*Phytochemistry* 1986, 25, 2187).

Distribution : Native to South Africa, introduced into Indian gardens.

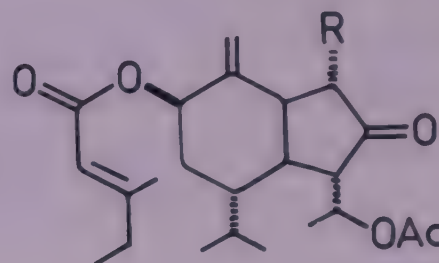
TUSSILAGO (Asteraceae)

T. farfara L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 662).

A new sesquiterpene ester - tussilagone (L-652,469) (14-acetoxy-7 β -(3'-ethylcrotonoyloxy)notonipetranone) - isolated from flowers and its crystal structure determined (*Huaxue Xuebao* 1987, 45, 450; *Chem. Abstr.* 1987, 107, 102504 n; *Eur. J. Pharmacol.* 1987, 141, 269); isolation and structure elucidation of three new sesquiterpenes (I, II and III) from flowers; β -sitosterol also isolated (*Beijing Yike Daxue Xuebao* 1987, 19, 33; *Chem. Abstr.* 1989, 110, 128286 e).

NEW COMPOUNDS

Tussilagone

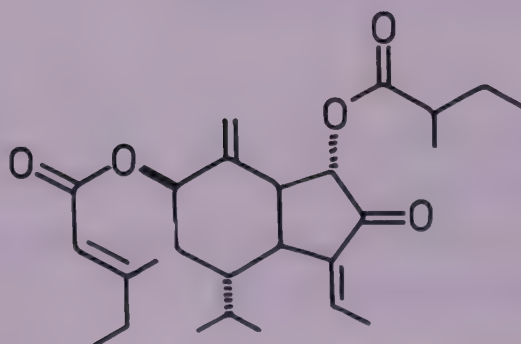


I

R = H

II

R = O.OCCH(Me)Et



III

BIOLOGICAL ACTIVITY

Tussilagone on i.v. injection caused strong and instant pressor responses in dogs, cats and rats (*Huaxue Xuebao* 1987, 45, 450; *Chem. Abstr.* 1987, 107, 102504 n); tussilagone (L-652,469) was found to inhibit both rabbit platelet activating factor (PAF). It also inhibited specific binding of Ca^{2+} channel blockers in sarcolemmal membrane from porcine left ventricle tissue (*Eur. J. Pharm.* 1987, 141, 269); sesquiterpenes II and III showed moderate activity in PAF-induced platelet aggregation test whereas sesquiterpene I was active with IC_{50} 1.0 $\mu\text{g/ml}$ (*Beijing Yike Daxue Xuebao* 1987, 19, 33; *Chem. Abstr.* 1989, 110, 128286 e).

TYLOPHORA (Asclepiadaceae)

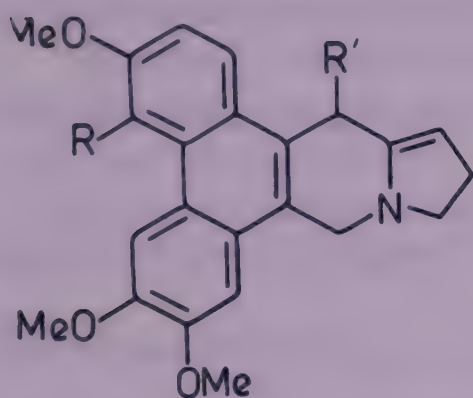
T. asthmatica W. & A.; see *T. indica* (Burm.f.) Merrill

T. hirsuta (Wall.) Wt. & Arn.

Isolation and structure elucidation of tylohirsutinine, 13a-methyltylohirsutine, tylohirsutinidine, 13a-methyltylohirsutinidine and 13a-hydroxysepticine (*Phytochemistry* 1984, 23, 1765); 13 α -hydroxytylophorine isolated (*Phytochemistry* 1985, 24, 2778); three new alkaloids - tylohirsuticine, 14-deoxy-13a-methyltylohirsutinidine and 5-hydroxy-6-O-methyltylophorinidine - isolated and their structures determined; (+)isotylocrebrine, 14-hydroxyisotylocrebrine, 4-desmethyisotylocrebrine and (-)tylophorine also isolated (*Phytochemistry* 1987, 26, 2089).

Distribution : Foothills of Kumaon and Garhwal ascending to 1500 m and Khasia Hills in Meghalaya, alt. 600 m.

NEW COMPOUNDS

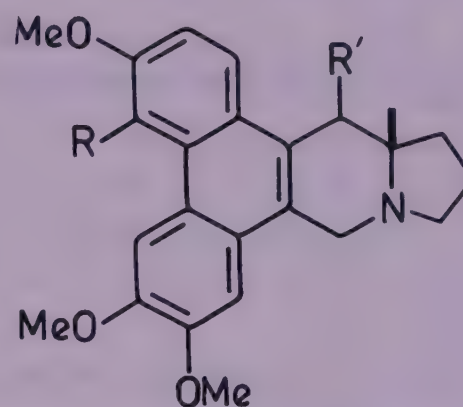


Tylohirsutinine

R = OMe, R' = H

Tylohirsutinidine

R, R' = OH



13a-Methyltylohirsutinidine

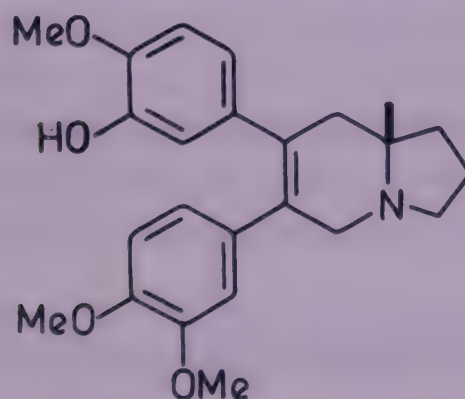
R, R' = OH

13a-Methyltylohirsutine

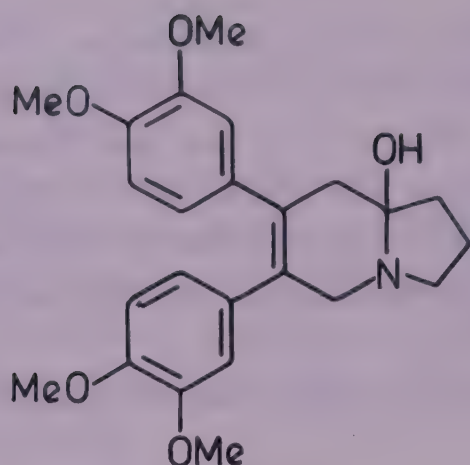
R = OMe, R' = H

14-Deoxy-13a-methyltylohirsutinidine

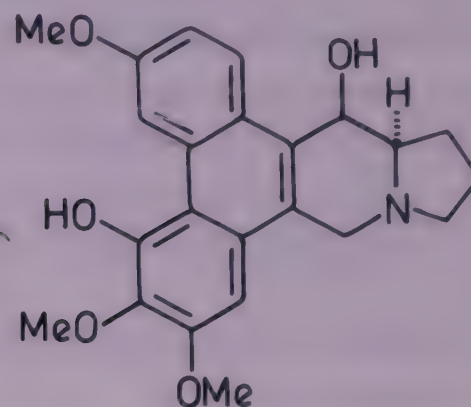
R = OH, R' = H



Tylohirsuticine



13a-Hydroxysepticine



5-Hydroxy-6-O-methyltylophorinidine

T. indica (Burm.f.) Merrill syn. *T. asthmatica* W. & A. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 663).

Enantio-selective synthesis of (+)tylophorine (*J. Org. Chem.* 1987, 52, 1627); synthesis of (-)tylophorine (*Heterocycles* 1989, 28, 63).

T. mollissima Wight (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 691).

Alkaloid content (0.01%) determined; caffeine, tylophorine and tylophorinine identified (*J. Nat. Prod.* 1985, 48, 997).

TYLOPHORUM (Papaveraceae)

T. lactuoides (Hook.f. & Thoms.) Benth. & Hook.f.; see *Dicranostigma lactuoides* Hook.f. & Thoms.

TYPHA (Typhaceae)

T. angustata Bory & Chaub. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 663).

BIOLOGICAL ACTIVITY

Narcissin on i.p. injection inhibited vasopressin-induced heart ischemia in rats and increased myocardial ^{86}Rb uptake in mice. In isolated rabbit aorta strips, it noncompetitively inhibited KCl and noradrenaline-induced contractions (*Zhongcaoyao* 1988, 19, 115; *Chem. Abstr.* 1988, 108, 216078 c).

T. elephantina Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 664).

Pentacosane, 1-triacontanol, β -sitosterol and its 3-O-glucoside isolated from fruits of plant from Thailand (*J. Sci. Soc. Thailand* 1987, 13, 57; *Chem. Abstr.* 1987, 107, 194922 y).

UNONA (Annonaceae)

U. dasymaschala Blume; see *Desmos dasymaschalus* (Blume) Safford var. *dasymaschalus*

U. desmos Raeusch.; see *Desmos cochinchinensis* Lour.

U. discolor Vahl; see *Desmos chinensis* Lour.

URARIA (Papilionaceae)

U. lagopodioides DC.; see *U. lagopodioides* (L.) Desv.

U. lagopodioides (L.) Desv. syn. *U. lagopodioides* DC. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 425).

3-Hydroxy-7,4'-dimethoxyflavone and five other flavonoids isolated (*Jinan Liyi Xuebao* 1986, 85; *Chem. Abstr.* 1986, 105, 149734 m).

BIOLOGICAL ACTIVITY

Flavonoids exhibited activity against snake venom (*Jinan Liyi Xuebao* 1986, 85; *Chem. Abstr.* 1986, 105, 149734 m).

URTICA (Urticaceae)

U. dioica L. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 693).

Homovanillyl alcohol, its 4'-monoglucoside, neoolivil-4-O- β -D-glucoside, 9,9'-bisacetyl-neoolivil and its 4-O- β -D-glucoside isolated from roots (*Dtsch. Apoth. Ztg.* 1986, 126, 1559; *Chem. Abstr.* 1986, 105, 149724 h); isolation of β -carotene, hydroxy- α -carotene, luteoxanthin, lutein epoxide and violaxanthin from fresh leaves (*Khim. Pri. Soedin.* 1986, 640; *Chem. Abstr.* 1987, 106, 64348 j); kaempferol, its 3-O-glucoside and 3-O-rutinoside, isorhamnetin, its 3-O-glucoside, 3-O-rutinoside and 3-O-neohesperidoside, isoquercitrin, rutin, quercetin, its 3-O-rutinoside and 3-O-glucoside isolated from flowers and foliage (*Herba Pol.* 1986, 32, 131; *Chem. Abstr.* 1988, 109, 146304 t; *Planta Med.* 1987, 53, 432); sitosterol, 7 α - and 7 β -hydroxy-sitosterols, sitosterol-3-O- β -D-glucoside and 24(R)ethyl-5 α -cholestane-3 β ,6 α -diol from roots (*J. Nat. Prod.* 1987, 50, 881).

UVARIA (Annonaceae)

U. narum (Dunal) Wt. & Arn. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 254).

Root bark oil showed significant antimicrobial activity against *Bacillus megathecium*, *Escherichia coli* and *Candida albicans*; it also exhibited anthelmintic activity and potentiated pentobarbitone-induced hypnosis (*Indian Drugs* 1986, 23, 647).

U. zeylanica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 666).

Absolute configuration and total synthesis of zeylena (*J. Org. Chem.* 1985, 50, 5075).

VALERIANA (Valerianaceae)

V. jatamansi Jones (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 666).

Iridoids - valtrate and acevaltrate - isolated (*Yunnan Zhiwu Yanjiu* 1986, 8, 107; *Chem. Abstr.* 1987, 107, 36671 m).

BIOLOGICAL ACTIVITY

Valtrate exhibited antineoplastic activity against cells of cervical cancer, stomach cancer and lung cancer (*Yunnan Zhiwu Yanjiu* 1986, 8, 107; *Chem. Abstr.* 1987, 107, 36671 m).

VATERIA (Dipterocarpaceae)

V. indica L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 667).

Isolation of bergenin and hopeaphenol from roots and leaves; ¹³C-NMR of hopeaphenol (*J. Indian Chem. Soc.* 1987, 64, 259).

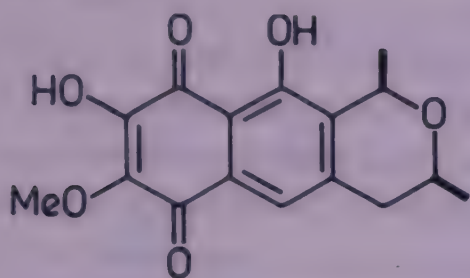
VENTILAGO (Rhamnaceae)

V. calyculata Tul.; see *V. denticulata* Willd.

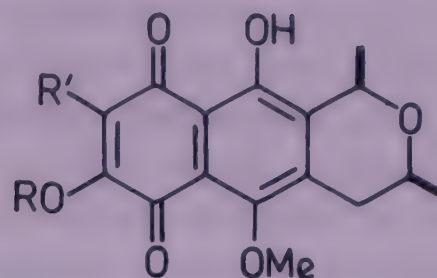
V. denticulata Willd. syn. *V. calyculata* Tul., *V. madraspatana* Gaertn. var. *calyculata* (Tul.) King (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 667).

A new naphthoquinone - 2-methoxystypandrone - and a new xanthone - calyxanthone (1-hydroxy-6-methoxy-3-methylxanthone-8-carboxylic acid) - isolated from root bark and characterised (*Phytochemistry* 1985, 24, 1811); isolation of new benzisochromanquinones - ventiloquinones I, J and K - from root bark and their structure elucidation (*Phytochemistry* 1985, 24, 2373); two more new benzisochromanquinones - ventilatones A and B - and two benzisochroman dimers - ventileins A and B - isolated from root bark and characterised (*Phytochemistry* 1985, 24, 2669); 1-O- α -L-rhamnoside, 8-O- α -L-rhamnoside and 8-O- β -D-glucoside of emodin isolated from root bark (*J. Nat. Prod.* 1986, 49, 343); synthesis of islandicin (*Tetrahedron* 1988, 44, 1015); structure of 2-methoxystypandrone confirmed by synthesis (*J. Chem. Soc. Perkin 1* 1989, 449).

NEW COMPOUNDS



Ventiloquinone I

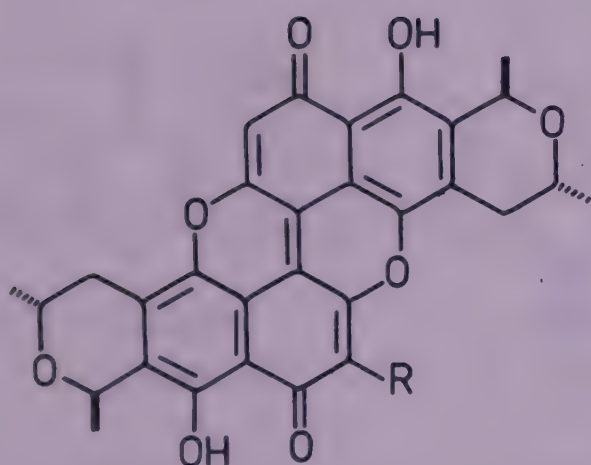


Ventiloquinone J

R = Me, R' = H

Ventiloquinone K

R = H, R' = OMe

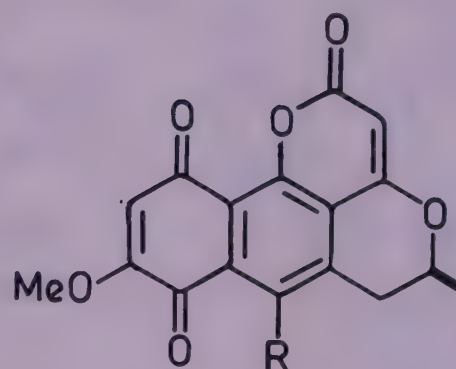


Ventilein A

R = H

Ventilein B

R = OMe

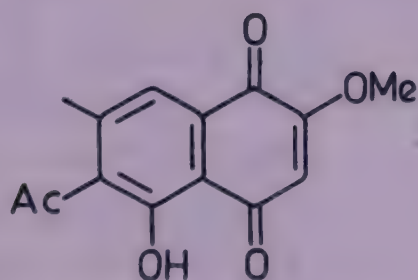


Ventilatorone A

R = H

Ventilatorone B

R = OH



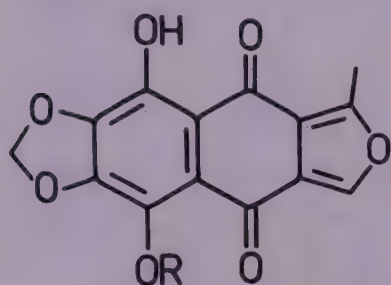
2-Methoxystypandrone

V. madraspatana Gaertn. (Compend. Indian Med. Plants, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 667).

New isofuranonaphthoquinones - ventilonones A, B, C, D and E - isolated from root bark and characterised as 4,9-dihydro-5,8-dihydroxy-6,7-methylenedioxy-1-methylnaphtho[2,3-c]furan-4,9-dione, its 5-methyl ether, 1,3,4,9-tetrahydro-8-hydroxy-5-methoxy-6,7-methylenedioxy-1-methylnaphtho[2,3-c]furan-4,9-dione, its 8-methyl and 5,8-dimethyl ethers

respectively; their crystal structures determined by X-ray analysis (*Tetrahedron* 1985, 41, 635); eight new benzisochromanquinones - ventiloquinones A, B, C, D, E, F, G and H - isolated from root bark and characterised (*Phytochemistry* 1985, 24, 2373); two new naphthalenes - ventilaginone and ventilagol - and three naphthoquinones - maderone, cordeauxione and isocordeauxione - isolated from root bark; ventilagol and maderone characterised as 1,3-dihydro-6,9-dihydroxy-7,8-dimethoxy-1-methylnaphtho[2,3-c]furan-3-one and 2-(2'-acetoxypropyl)-3-hydroxy-5,7,8-trimethoxy-1,4-naphthoquinone respectively; structure of ventilaginone proposed (*Phytochemistry* 1985, 24, 1811); proposed structure of ventilaginone found to be incorrect by synthesis and its revised structure suggested (*J. Chem. Soc. Perkin* 1 1989, 449).

NEW COMPOUNDS

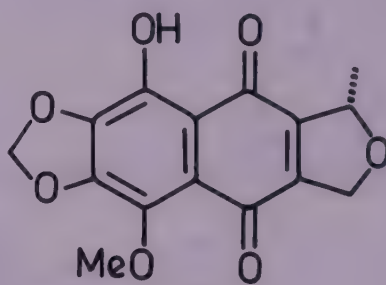


Ventilone A

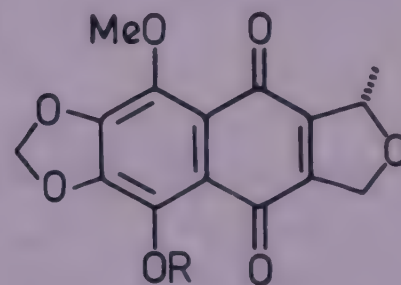
R = H

Ventilone B

R = Me



Ventilone C

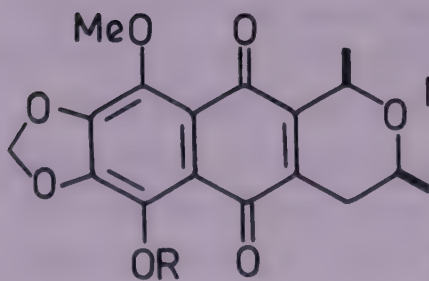


Ventilone D

R = H

Ventilone E

R = Me

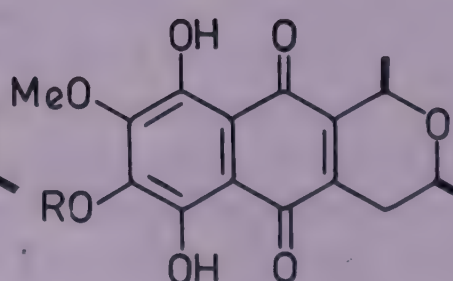


Ventiloquinone A

R = H

Ventiloquinone B

R = Me

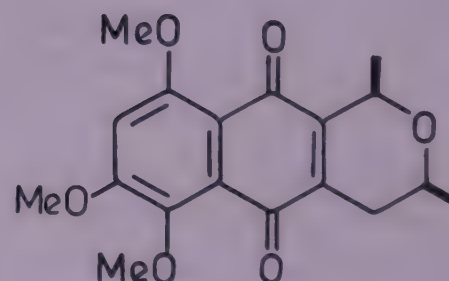


Ventiloquinone C

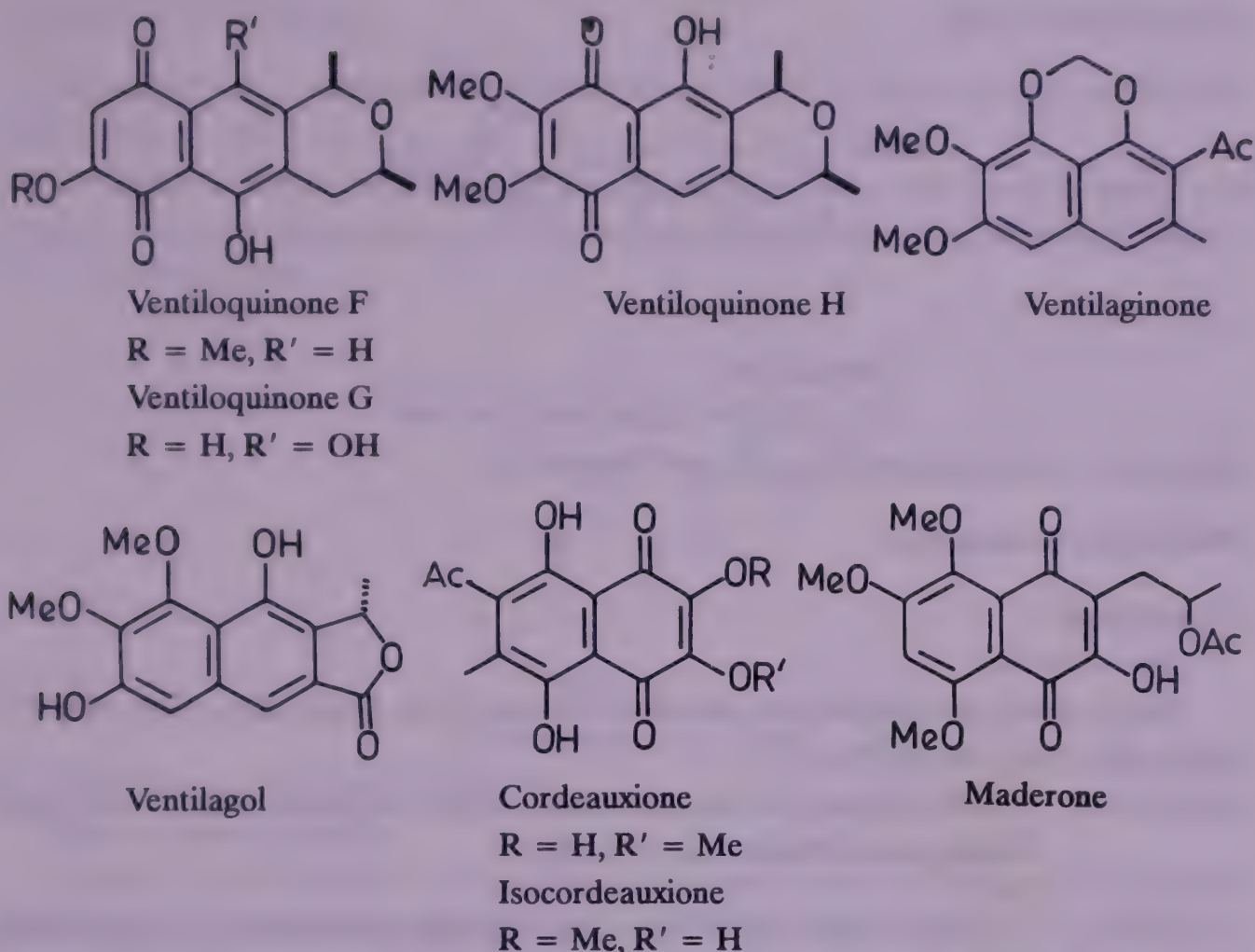
R = H

Ventiloquinone D

R = Me



Ventiloquinone E



V. madraspatana Gaertn. var. *calyculata* (Tul.) King; see *V. denticulata* Willd.

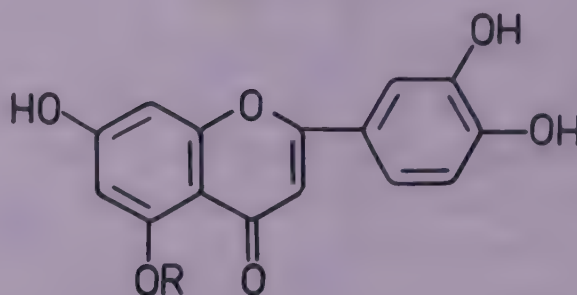
VERBASCUM (Scrophulariaceae)

V. thapsiforme Schrad.; see *V. thapsus* L.

V. thapsus L. syn. *V. thapsus* L. var. *thapsiforme* Hook.f., *V. thapsiforme* Schrad. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 668).

Determination of essential oil (1.6%) in flowers; caffeic (0.48%), p-coumaric, ferulic, p-hydroxybenzoic, linoleic, palmitic, protocatechuic and vanillic acids detected in flowers (*Herba Pol.* 1984, 30, 173; *Chem. Abstr.* 1986, 104, 145555 k); aucubin, its 6-O- β -xylosyl derivative and 24 α -methyl-5 α -cholestan-3-one identified (*Phytochemistry* 1988, 27, 3541); new triglycoside of luteolin - verbacoside - isolated and characterised (*J. Nat. Prod.* 1989, 52, 640); isolation of new flavonoid - 7,4'-dihydroxyflavone-4'-rhamnoside - from leaves and flowers together with 6-hydroxyluteolin-7-glucoside and quercetin 3'-methyl ether (*Sci. Pharm.* 1989, 57, 59; *Chem. Abstr.* 1989, 111, 83947 y).

NEW COMPOUNDS



Verbacoside

R = Glu[(3→1)Rha](6→1)Gluc.acid

V. thapsus L. var. *thapsiforme* Hook.f.; see *V. thapsus* L.

VERBENA (Verbenaceae)

V. bonariensis L.

Eng. - Verbena.

Griselinoside, nodifloretin and penduletin isolated (*Boll. Chim. Farm.* 1984, 123, 477; *Chem. Abstr.* 1985, 102, 109903 x).

Distribution : A native of South America, introduced into Indian gardens, now wild in western Himalayas and Nilgiris, alt. 800-1200 m.

V. officinalis L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 669).

Plant is used for rheumatism in folk medicine (*Arch. Pharm.* 1986, 319, 227; *Chem. Abstr.* 1986, 104, 221995 w).

Verbenalin and β -sitosterol as antitussive constituents isolated (*Zhongyao Tongbao* 1985, 10, 467; *Chem. Abstr.* 1986, 104, 203945 a); verbascoside (0.8%) and its nonacetate isolated (*Arch. Pharm.* 1986, 319, 227; *Chem. Abstr.* 1986, 104, 221995 w); isolation of artemetin, aucubin, lupeol, β -sitosterol and ursolic acid from aerial parts (*Fitoterapia* 1986, 57, 50); synthesis of (-)-verbenalol (*Tetrahedron Lett.* 1988, 29, 611).

VERBESINA (Asteraceae)

V. oncophora Robins. & Seat.

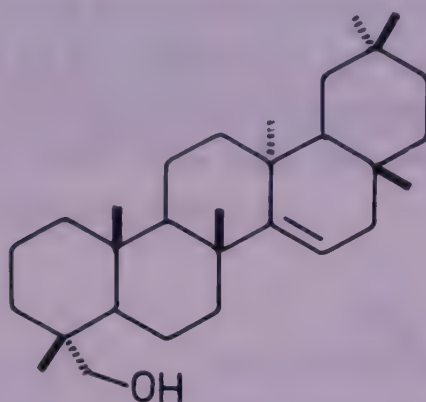
Caryophyllene epoxide, desoxyeuparin, germacrene D, lupeol acetate, α -pinene, δ -selinene and taraxasteryl acetate isolated (*Rev. Latinoam. Quim.* 1987, 18, 113; *Chem. Abstr.* 1988, 108, 218959 q).

Distribution : Native of tropical America, introduced into India in gardens.

VERNONIA (Asteraceae)

V. cinerea (L.) Less. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 670).

Isolation of a new triterpene - 24-hydroxytaraxer-14-ene - from roots together with campesterol and α -spinasterol; new compound characterised (*J. Nat. Prod.* 1984, 47, 865).

NEW COMPOUNDS

24-Hydroxytaraxer-14-ene

V. volkameriaefolia DC. (*volkameriifolia*)

Khasi - Dieng-duma-blai.

Lupeol acetate, friedelin, epifriedelinol, stigmasterol, α -amyrin and its acetate identified in leaves (*Zhongcaoyao* 1985, 16, 530; *Chem. Abstr.* 1986, 104, 106272 w).

Distribution : Sikkim and Meghalaya, altitude 200-1600 m.

VERONICA (Scrophulariaceae)

V. anagallis L.; see *V. anagallis aquatica* L.

V. anagallis aquatica L. syn. *V. anagallis* L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 670).

Isolation of 4'-methoxyscutellarein-7-O-glucoside, 6-hydroxyluteolin-7-O-glucoside and its 7-O-diglucoside, cosmosiin and cynaroside (*Khim. Prir. Soedin.* 1984, 655; *Chem. Abstr.* 1985, 102, 75691 j).

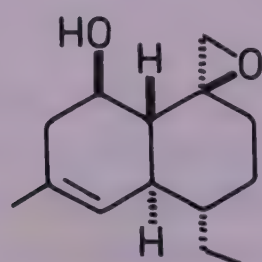
V. beccabunga L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 254).

4'-Methoxyscutellarein-7-O-glucoside, 6-hydroxyluteolin-7-O-glucoside and its 7-O-diglucoside, cosmosiin and cynaroside isolated (*Khim. Prir. Soedin.* 1984, 655; *Chem. Abstr.* 1985, 102, 75691 j).

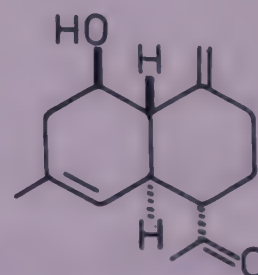
VETIVERIA (Poaceae)

V. zizanioides (L.) Nash syn. *Andropogon squarrosus* Hook.f. (non L.f.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 670).

Synthesis of epikhusinol (*Chem. Ind.* 1985, 412); a new antipodal C14-terpenoid - norkhusinol oxide - isolated from oil and its stereostructure determined; stereostructural features confirmed by comparison of its plant growth activity which matched with that of khusinol oxide of known stereostructure (*Tetrahedron* 1985, 41, 3387); another C14-terpenoid alcohol - khusitoneol - from oil and determination of its absolute configuration (*Indian J. Chem.* 1985, 24B, 496); (-)khusimone synthesised (*Tetrahedron* 1988, 44, 6581); stereoselective synthesis of (-) β -vetivone (*Chem. Lett.* 1988, 1225; *Chem. Abstr.* 1989, 111, 78398 r).

NEW COMPOUNDS

Norkhusinol oxide



Khusitoneol

BIOLOGICAL ACTIVITY

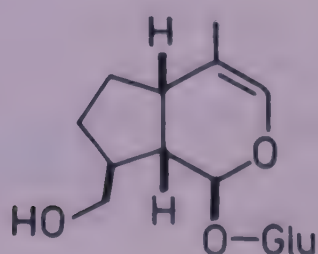
Khusitoneol exhibited juvenile hormone activity against mustard aphid (*Lipaphis erysmi*) (*Indian J. Chem.* 1985, 24B, 496).

VIBURNUM (Caprifoliaceae)

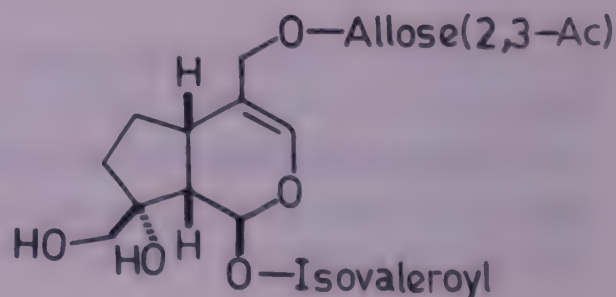
V. betulifolium Batalin

New iridoids.- viburnalloside and decapetaloside (10-hydroxyiridodial glucoside) - isolated from bark and characterised; absolute configuration of viburnalloside also determined (*Phytochemistry* 1985, 24, 487).

Distribution : Arunachal Pradesh.

NEW COMPOUNDS

Decapetaloside



Viburnalloside

V. coriaceum Blume; see *V. cylindricum* Buch.-Ham. ex D. Don

V. cylindricum Buch.-Ham. ex D.Don syn. *V. coriaceum* Blume

Kumaon - Kala titmaliya, Titmaliya, Titmulia, Tita, Karwa; Khasi - Soh-jia-hynlam, Dieng-soh-law; Nep. - Baragorakuri, Pitchenchor.

Isolation of amentoflavone and apigenin from leaves (*J. Sci. Res.* 1983, 5, 27; *Chem. Abstr.* 1985, 102, 109813 t).

Distribution : Himalayas, from Punjab eastwards, Khasia Hills and Nilgiris, altitude 1200-2500 m.

V. grandiflorum Wall. ex DC. syn. *V. nervosum* sensu Clarke (non D.Don) (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 700).

Isolation of bergenin from roots and rhizomes (*Indian Drugs* 1988, 25, 217).

V. nervosum D.Don; see *V. grandiflorum* Wall. ex DC.

VICATIA (Apiaceae)

V. achilleifolia (DC.) P.K.Mukh. syn. *Pimpinella achilleifolia* (DC.) Clarke

Determination of p-cymene (52.22), limonene (9.29), α -phellandrene (8.96%) and car-2-ene in oil from aerial parts by GC-MS (*Fitoterapia* 1985, 56, 351).

Distribution : Himalayas, from Kumaon to Sikkim, alt. 2400-3900 m.

VICIA (Papilionaceae)

V. angustifolia L. syn. *V. sativa* L. var. *angustifolia* (L.) Wahlenberg (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 255).

New flavonol glycoside - quercetin-3-O-galactosyl(1 \rightarrow 6)glucoside - isolated from aerial parts (*Phytochemistry* 1985, 24, 243); 3-hydroxypropenoic acid, vicianin, stigmasterol, β -sitosterol and its glucoside isolated from seeds (*Kinki Daigaku Rikogakubu Kenkyu Hokoku* 1985, 133; *Chem. Abstr.* 1986, 104, 17659 k).

BIOLOGICAL ACTIVITY

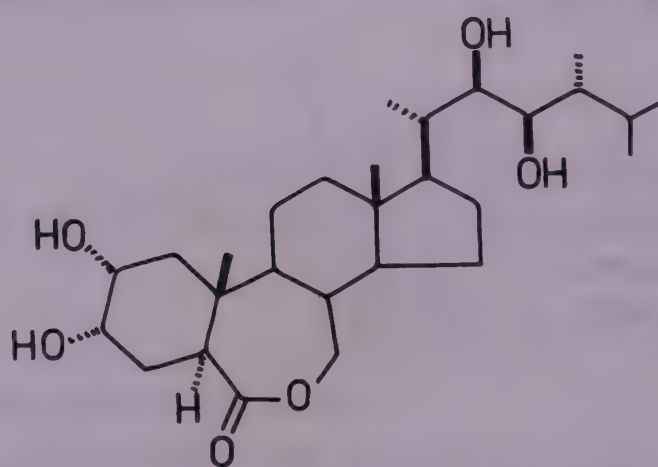
Quercetin-3-O-galactosyl(1 \rightarrow 6)glucoside exhibited antibacterial activity against *Pseudomonas maltophilia* and *Enterobacter cloacae* (*Phytochemistry* 1985, 24, 243).

V. faba L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 672).

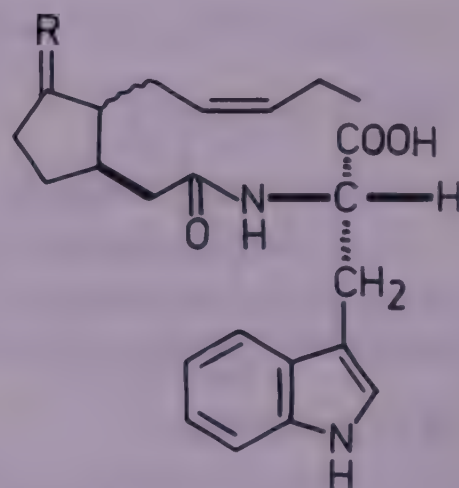
Eugenol (28.49), hexadecanoic acid (17.06), linalool (12.32), 6,10,14-trimethyl-2-pentadecanone (9.28), isoeugenol (7.50), octadecadienoic acid (4.59), α -terpineol (2.04), methoxyeugenol (1.65), 1-(4-methoxyphenyl)ethanone (1.03), octadecanoic acid (0.97), tetradecanoic acid (0.49), heptadecanoic acid (0.14) and octadecatrienol (0.14%) determined in flower oil (*Youji Huaxue* 1986, 213; *Chem. Abstr.* 1986, 105, 102313 h); isoquercitrin, rutin, cosmosiin, cinaroside bioquercetin and antoside present (*Khim. Pri. Soedin.* 1986, 778; *Chem.*

Abstr. 1987, 106, 135332 n); isolation of N-[-]jasmonoyl](S)tyrosine from flowers and its characterisation (*Phytochemistry* 1986, 25, 2236); flowers also afforded N-[-]jasmonoyl](S)tryptophan (I) alongwith N-[(+)]cucurbinoyl](S)tryptophan (II) (*Phytochemistry* 1988, 27, 275); 24-epibrassinolide isolated from leaves and characterised; in addition, brassinolide, brassinone and castasterone isolated (*Chem. Pharm. Bull.* 1988, 36, 405); an endogenous abscisic acid metabolite - nigellic acid - detected in leaves by GC-MS (*Phytochemistry* 1988, 27, 677); isofucosterol (37.2), 24-methylenecholesterol (24.7), 24-methylene-cholestanol (15.8), sitosterol (8.8), 23-dehydrocampestanol (5.9), 23-dehydrocholesterol (1.9), 25-dehydrositostanol (1.7), 24-methyl-desmosterol (0.8), cholesterol (0.6) and 24-ethyl-desmosterol (0.5%) determined in pollens by GC-MS (*Agric. Biol. Chem.* 1989, 53, 259).

NEW COMPOUNDS



24-Epibrassinolide



I

R = O, ~ = α

II

R = α -OH,H, ~ = β

V. sativa L. var. *angustifolia* (L.) Wahlenberg; see *V. angustifolia* L.

VICOA (Asteraceae)

V. auriculata Cass.; see *Pentanema indicum* (L.) Ling

V. indica (L.) DC.; see *Pentanema indicum* (L.) Ling

V. vestita (Wall. ex DC.) Benth. & Hook.f.; see *Pentanema vestitum* (Wall. ex DC.) Ling

VIGNA (Papilionaceae)

V. catajang (Burm.f.) Walp.; see *V. unguiculata* (L.) Walp.

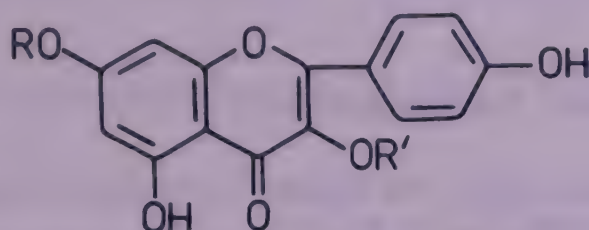
V. cylindrica (L.) Skeels; see *V. unguiculata* (L.) Walp.

V. luteola Benth.

Two new flavonol glycosides (I and II) isolated from aerial parts and their structures determined (*J. Nat. Prod.* 1989, 52, 511).

Distribution : Sunderbans in West Bengal.

NEW COMPOUNDS



I

R = H, R' = Gal(6→1)Rha(4→1)Rha

II

R = Rha, R' = Gal(6→1)Rha(4→1)Rha

V. mungo (L.) Hepper syn. *Phaseolus mungo* L. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 190).

Saponin (50.0 µg/ml) from plant exhibited spasmolytic activity as shown by inhibition of histamine-induced contraction (50%) of smooth muscle of intestine; it also showed diuretic effect (*Indian J. Pharm.* 1985, 17, 178).

V. radiata (L.) Wilczek var. *radiata* syn. *Phaseolus radiatus* L., *P. aureus* Roxb., *P. radiatus* L. var. *aureus* (Roxb.) Prain, *P. mungo* auct. (non L.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 674).

Effect of ether extract was compared to that of paracetamol in yeast-induced hyperpyrexia in rats. After 18 hr of injection of yeast (15% suspension), ether extract (0.1 and 0.2 ml) and paracetamol (0.2 mg/100 g) were given to three groups of rats. All groups showed significant reduction in average temperature within one hr. Reduction in temperature was maximum at 2 hr in paracetamol-treated group, and 3 hr in case of extract-treated groups. Paracetamol (20.0 mg/kg) and ether extract (2.0 ml/kg) showed almost similar reduction in temperature (*J. Res. Ayurveda & Siddha* 1983, 4, 67).

Three compounds - (E)p-coumaroyl-, (E)caffeoyl- and (E)feruloyl-tartronic acids - isolated from leaves (*Phytochemistry* 1985, 24, 147); three new γ-glutamyl peptides - γ-glutamyl-S-methylcysteinyl-β-alanine, γ-glutamyl-Nδ-acetylornithine and γ-glutamyl-γ-glutamyl-S-methylcysteine - isolated from seeds along with homoglutathione and γ-glutamyl derivatives of glutamic acid, aspartic acid, phenylalanine, leucine and isoleucine (*Phytochemistry* 1986, 25, 679); scopoletin, isoscapoletin, umbelliferone, rutin, quercetin, kaempferol, chlorogenic acid and neochlorogenic acid isolated from aerial parts (*Khim. Pri. Soedin.* 1988, 456; *Chem. Abstr.* 1988, 109, 208314 g); daidzein, daidzin, formononetin, ononin,

quercetin-3-O-sophoroside and -3-O- β -D-glucuronide, isoquercitrin and kaempferol-3-O- β -D-glucuronide also isolated from aerial parts (*Khim. Pri. Soedin.* 1988, 756; *Chem. Abstr.* 1989, 110, 132184 n).

BIOLOGICAL ACTIVITY

Saponins showed potent antinicotinic activity and produced diuretic effect (*Indian J. Pharm.* 1985, 17, 178).

V. sinensis (L.) Savi ex Hassk.; see *V. unguiculata* (L.) Walp.

V. trilobata (L.) Verdc. syn. *Phaseolus trilobus* sensu Ait. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 190).

Isolation of vitexin, kaempferol, luteolin and quercetin from seeds (*Herba Hung.* 1989, 28, 67; *Chem. Abstr.* 1989, 111, 191495 h).

V. unguiculata (L.) Walp. syn. *V. cylindrica* (L.) Skeels, *V. catajang* (Burm.f.) Walp., *V. sinensis* (L.) Savi ex Hassk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 675).

Five pure trypsin inhibitors - A2-a, A2-b, A2-c, A2-d and A2-e - isolated from seeds (*Fujian Shifan Daxue Xuebao, Ziran Kexueban* 1986, 2, 72; *Chem. Abstr.* 1987, 107, 194885 p); isolation of phytohemagglutinin from seeds (*Zhongguo Yaoxue Zazhi* 1989, 24, 145; *Chem. Abstr.* 1989, 111, 140299 q); α -cedrene, 1,8-cineole, hexanal, hex-(Z)3-en-1-ol, hexyl acetate, limonene, nonanal, 1-nonene, (E) β -ocimene, α - and β -pinenes identified in airborne volatiles (*Phytochemistry* 1989, 28, 421).

BIOLOGICAL ACTIVITY

Saponin (50.0 μ g/ml) inhibited contraction (42.0%) of smooth muscles of intestine caused by acetyl choline; it also had diuretic effect (*Indian J. Pharm.* 1985, 17, 178).

VINCA (Apocynaceae)

V. rosea L.; see *Catharanthus roseus* (L.) G. Don

VISCUM (Loranthaceae)

V. articulatum Burm.f. syn. *Aspidixia articulata* (Burm.f.) Van Tiegh. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 676).

Isolation of α -amyrin, betulin, betulinic acid, lupeol and oleanolic acid (*J. Indian Chem. Soc.* 1984, 61, 727).

VITEX (Verbenaceae)

V. glabrata R.Br. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 256).

Isolation of 20-hydroxy- and 11 α ,20-dihydroxy-ecdysone from bark (*J. Nat. Prod.* 1986, 49, 364).

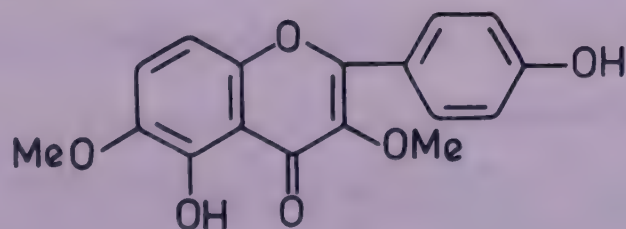
V. negundo L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 676).

Petrol ether (PE) and n-butanol (BE) extracts of roots produced moderate CNS depression; PE prolonged pentobarbitone sleep and also protected mice against pentylenetetrazole convulsions; chloroform extract (CHE) shortened diazepam sleep; BE and ethanol extracts produced marked antiparkinsonian effect; CHE markedly suppressed carrageenin pedal oedema in rats (*J. Res. Ayurveda & Siddha* 1986, 7, 62).

Isolation of 5-hydroxy-3,6,7,3',4'-pentamethoxyflavone and 3,5-dihydroxy-6,7,3',4'-tetramethoxyflavonol from leaves (*J. Bangladesh Acad. Sci.* 1984, 8, 23; *Chem. Abstr.* 1985, 103, 19867 e); structures of 5,4'-dihydroxy-7,8,3',5'-tetramethoxyflavone, isomeric 5,3'-dihydroxy-7,8,4'-trimethoxyflavanone and 5,3'-dihydroxy-6,7,4'-trimethoxyflavanone confirmed by synthesis (*Indian J. Chem.* 1987, 26B, 82).

V. peduncularis Wall. ex Schauer (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 431).

A new flavonoid - peduncularisin - isolated from leaves along with pachypodol, vitexin, ursolic acid and 2 α -hydroxyursolic acid; peduncularisin characterised (*Planta Med.* 1984, 50, 527).

NEW COMPOUNDS

Peduncularisin

V. trifolia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 677).

Isoorientin, 7-O- β -D-glucuronide and 3'-O- β -D-glucuronide of luteolin isolated from leaves (*Fitoterapia* 1986, 57, 282).

VITIS (Vitaceae)

V. pallida Wt. & Arn.; see *Cissus pallida* (Wt. & Arn.) Planch.

V. vinifera L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 678).

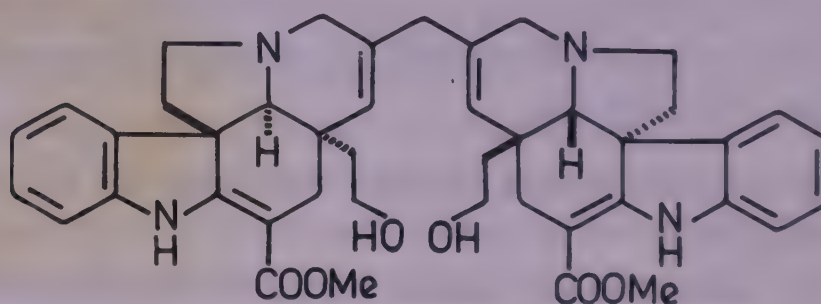
Betulinic acid, lupeol, 30-norlupan-3 β -ol-20-one, heptacosanol, triacontanol, triacontanyl tridecanoate and stigmasterol identified in roots (*Acta Cienc. Indica, Chem.* 1984, 10, 39; *Chem. Abstr.* 1985, 103, 102045 f); synthesis of resveratrol (*An. Quim.* 1985, 81C, 157; *Chem. Abstr.* 1986, 105, 133624 q); (-)epicatechin-3-O-gallate and procyanidin B2-3'-O-gallate identified by HPLC-GC (*J. Chromatogr.* 1988, 455, 406); jasmonic acid identified in buds, leaves and young fruits (*Dokl. Bolg. Akad. Nauk* 1988, 41, 99; *Chem. Abstr.* 1988, 109, 3855 n).

VOACANGA (Apocynaceae)

V. grandifolia (Miq.) Rolfe (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 705).

A new bisindole alkaloid - voacinol - isolated from leaves together with desacetylvindoline and its structure elucidated (*Chem. Commun.* 1987, 1137).

NEW COMPOUNDS



Voacinol

VOLUTARELLA (Asteraceae)

V. divaricata Benth. & Hook.f.; see *Amberboa ramosa* (Roxb.) Jafri

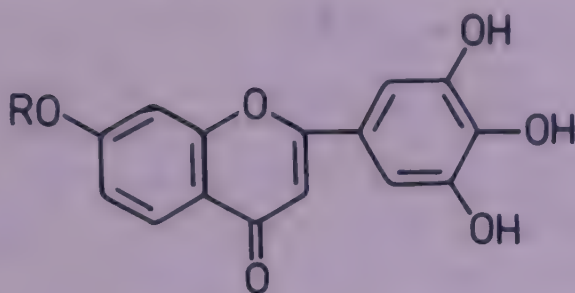
VOLVULOPSIS (Convolvulaceae)

V. nummularia (L.) Roberty syn. *Evolvulus nummularius* (L.) L.

A new flavone - 7,3',4',5'-tetrahydroxyflavone - and its two glycosides - evolvusides A and B - isolated and characterised (*Shoyakugaku Zasshi* 1984, 38, 341; *Chem. Abstr.* 1985, 103, 147025 r).

Distribution : Throughout plains of India and Nepal.

NEW COMPOUNDS



Evolvuside A

R = Rha

Evolvuside B

R = Glu

WAHLENBERGIA (Campanulaceae)*W. gracilis* DC.; see *W. marginata* (Thunb.) DC.*W. marginata* (Thunb.) DC. syn. *W. gracilis* DC.

Mundari - Tosad kesari.

Sucrose, glucose, methyl 9,12-octadecadienoate, β -sitosterol, its glucoside and lupenone identified in roots (*Lanzhou Daxue Xuebao, Ziran Kexueban* 1987, 23, 159; *Chem. Abstr.* 1988, 109, 107669 w).

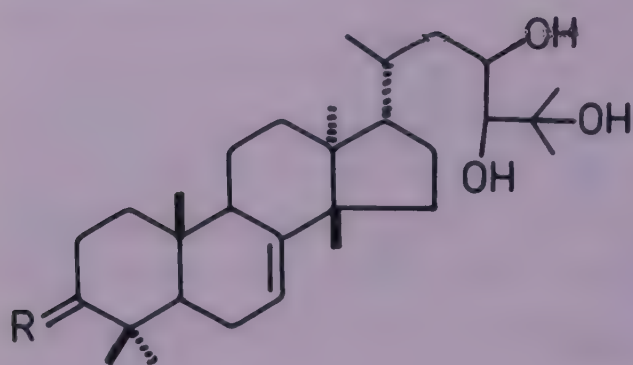
Distribution : Throughout Indian plains, ascending to 2100 m in hills.

WALSURA (Meliaceae)*W. piscidia* Roxb.; see *W. trifoliata* (A. Juss.) Harms*W. ternata* Roxb.; see *W. trifoliata* (A. Juss.) Harms

W. trifoliata (A. Juss.) Harms (*trifolia*) syn. *W. piscidia* Roxb., *W. ternata* Roxb. (*Glossary Indian Med. Plants*, Chopra, Nayar & Chopra, PID, New Delhi, 1956, p. 258).

A new tetranortriterpenoid - piscidofuran - isolated from fruits and characterised; in addition, new tirucallanes - piscidinols A and B - and new apotirucallanes - piscidinols C, D and E - isolated from leaves and their structures determined (*Phytochemistry* 1985, 24, 2349).

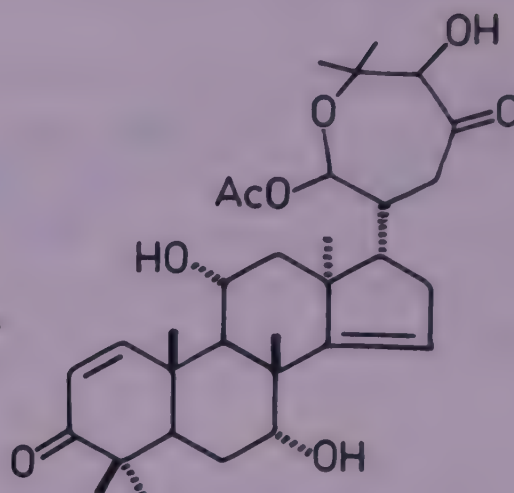
NEW COMPOUNDS



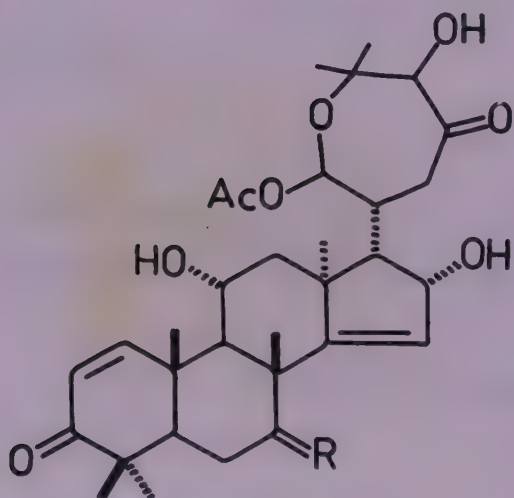
Piscidinol A

R = O

Piscidinol B

R = β -OH,H

Piscidinol C

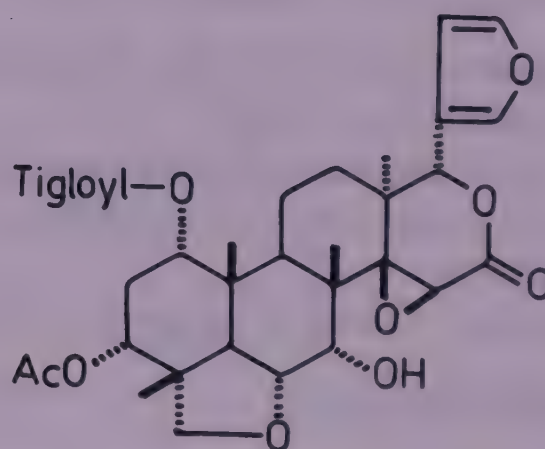


Piscidinol D

R = α -OH,H

Piscidinol E

R = O



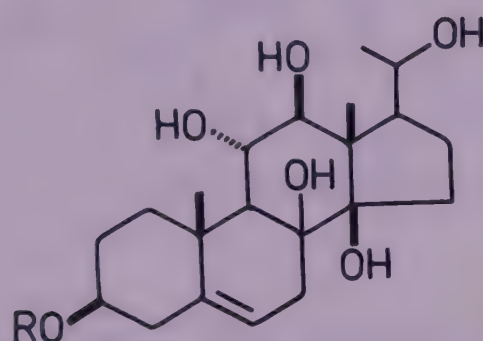
Piscidofuran

WALTHERIA (Sterculiaceae)*W. americana* L.; see *W. indica* L.*W. indica* L. syn. *W. americana* L. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 432).Apigeninidin detected in flowers (*J. Chem. Soc. Pak.* 1986, 8, 545; *Chem. Abstr.* 1987, 106, 153084 n).

WATTAKAKA (Asclepiadaceae)

W. volubilis (L.f.) Stapf syn. *Dregea volubilis* (L.f.) Benth. ex Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 678).

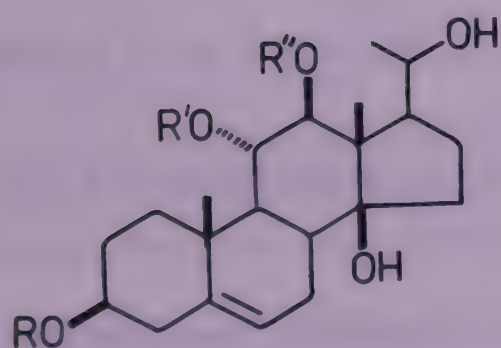
Five new glycosides - dregeosides H, Dp1, Da1, Gp1, Ga1 - isolated and characterised (*Chem. Pharm. Bull.* 1985, 33, 2287); two biosides, I (0.016) and II (0.0097%), isolated from hydrolysate of glycoside from roots of plant grown in Dehong, Yunnan and characterised as α -methylpachybioside and α -methyldredehonbioside (α -methyl-[3-O-methyl-6-deoxy-D-allose(1 \rightarrow 4)-D-olivoid]) respectively (*Zhiwu Xuebao* 1988, 30, 297; *Chem. Abstr.* 1989, 110, 4673 j).

NEW COMPOUNDS

Dregeoside H

R = Digitoxose(4 \rightarrow 1)Cymarose(4 \rightarrow 1)X

X = 6-Deoxy-3-O-methylallose



Dregeoside Dp1

R = Cymarose(4 \rightarrow 1)Cymarose(4 \rightarrow 1)Oleandrose(4 \rightarrow 1)X, R', R'' = H

Dregeoside Da1

R = Cymarose(4 \rightarrow 1)Cymarose(4 \rightarrow 1)X, R', R'' = H

Dregeoside Gp1

R = Cymarose(4 \rightarrow 1)Cymarose(4 \rightarrow 1)Oleandrose(4 \rightarrow 1)X, R' = Ac, R'' = Isovaleroyl

Dregeoside Ga1

R = Cymarose(4 \rightarrow 1)Cymarose(4 \rightarrow 1)X, R' = Ac, R'' = Isovaleroyl

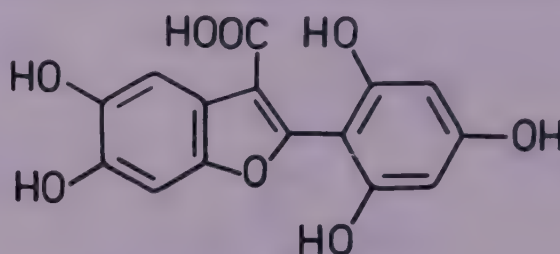
X = 6-Deoxy-3-O-methylallose

WEDELIA (Asteraceae)

W. calendulacea Less.; see *W. chinensis* (Osbeck) Merr.

W. chinensis (Osbeck) Merr. syn. *W. calendulacea* Less. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 434).

Isolation of a new benzofuran - norwedelic acid - from leaves and its structure elucidation; norwedelolactone also isolated (*Phytochemistry* 1985, 24, 3068).

NEW COMPOUNDS

Norwedelic acid

WENDLANDIA (Rubiaceae)

W. bicuspidata Wt. & Arn. syn. *W. notoniana* Wall. ex Wt. & Arn. var. *bicuspidata* (Wt. & Arn.) Hook.f., *W. notoniana* Wall. ex Wt. & Arn. var. *zeylanica* Hook.f.

Scandoside methyl ester isolated from wood (*J. Nat. Prod.* 1987, 50, 1184).

Distribution : Kerala.

W. notoniana Wall. ex Wt. & Arn. var. *bicuspidata* (Wt. & Arn.) Hook.f.; see *W. bicuspidata* Wt. & Arn.

W. notoniana Wall. ex Wt. & Arn. var. *zeylanica* Hook.f.; see *W. bicuspidata* Wt. & Arn.

WIKSTROEMIA (Thymelaeaceae)

W. indica (L.) C.A.Mey. syn. *W. indica* (L.) C.A.Mey. var. *viridiflora* (Meissn.) Hook.f., *W. viridiflora* Meissn. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 680).

A polysaccharide (WIP-I) containing glucose, arabinose, galacturonic acid, galactose and xylose in molar ratio of 28:6:1:2:1 isolated (*Zhongcaoyao* 1988, 19, 102; *Chem. Abstr.* 1988, 109, 35265 m).

BIOLOGICAL ACTIVITY

Polysaccharide (WIP-I) protected mice against radiation and enhanced formation of macrophages (*Zhongcaoyao* 1988, 19, 102; *Chem. Abstr.* 1988, 109, 35265 m).

W. indica (L.) C.A.Mey. var. *viridiflora* (Meissn.) Hook.f.; see *W. indica* (L.) C.A.Mey.

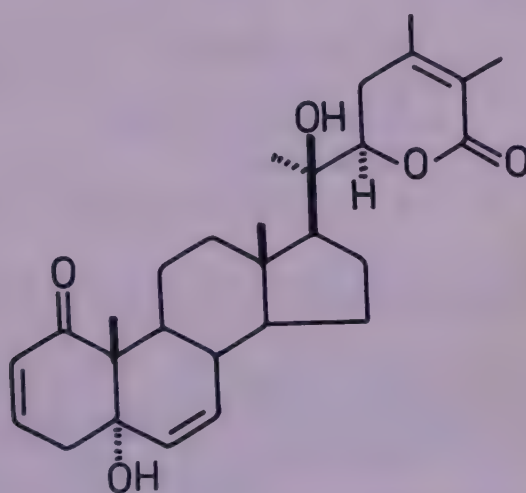
W. viridiflora Meissn.; see *W. indica* (L.) C.A.Mey.

WITHANIA (Solanaceae)

W. coagulans (Stocks) Dunal (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 681).

A new withanolide - withacoagin - isolated from roots and characterised as (20R,22R) 5 α ,20-dihydroxy-1-oxowitha-2,6,24-trienolide; withaferin A, (20R,22R)6 α ,7 α -epoxy-5 α ,20-dihydroxy-1-oxowitha-2,24-dienolide and (20S,22R)6 α ,7 α -epoxy-5 α -hydroxy-1-oxowitha-2,24-dienolide also isolated (*Bull. Chem. Soc. Jpn.* 1988, 61, 4479).

NEW COMPOUNDS



Withacoagin

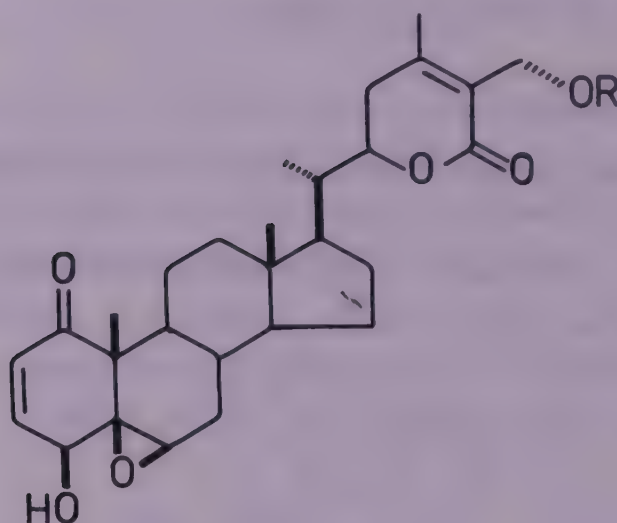
BIOLOGICAL ACTIVITY

3 β -Hydroxy-2,3-dihydrowithanolide F exhibited anti-inflammatory activity in subacute inflammation in rats; it was five times as potent as phenylbutazone and equipotent to hydrocortisone (*Planta Med.* 1984, 50, 134).

W. somnifera (L.) Dunal (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 682).

Three withanolides isolated from Egyptian plant, of these two characterised as 14,17,20-trihydroxy-5 β ,6 β -epoxy-1-oxowitha-2,24-dienolide (substance A) and 4,14,17,20-tetrahydroxy-5 β ,6 β -epoxy-1-oxowitha-2,24-dienolide (substance C) (*Bull. Pharm. Sci., Assiut Univ.* 1984, 7, 430; *Chem. Abstr.* 1986, 104, 203843 r); synthesis of withasomnine (*Synth. Commun.* 1985, 15, 259; *Chem. Abstr.* 1985, 103, 123754 b); isolation of two new glycowithanolides - sitoindoside IX and sitoindoside X - from roots and their characterisation (*Indian J. Nat. Prod.* 1988, 4(1), 12; *Chem. Abstr.* 1989, 110, 151258 f).

NEW COMPOUNDS



Sitoindoside IX

R = Glu

Sitoindoside X

R = Glu(6-O-palmitoyl)

BIOLOGICAL ACTIVITY

Double-blind clinical trial carried out to study effect of plant on prevention of ageing in 101 normal healthy males in 50-59 years age group. Root powder (0.50 g) was given orally three times a day for one year. Results showed statistically significant increase in haemoglobin, R.B.C., hair melanin and seated stature in treated group in comparison to placebo group. Decrease in serum cholesterol was more and erythrocyte sedimentation rate much higher in treated group than in placebo group (*J. Res. Ayurveda & Siddha* 1980, 1, 247); withanolide D exhibited significant antitumor activity *in vivo* against sarcoma 180 and Ehrlich ascites carcinoma and *in vitro* against cells from human epidermoid carcinoma of nasopharynx (KB) (*Indian J. Cancer Chemother.* 1985, 7, 59; *Chem. Abstr.* 1987, 106, 131323 n).

WOODFORDIA (Lythraceae)

W. floribunda Salisb.; see *W. fruticosa* (L.) Kurz

W. fruticosa (L.) Kurz syn. *W. floribunda* Salisb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 684).

Lupeol (0.023), ursolic acid (0.022), β -sitosterol (0.008), betulin (0.004), betulinic acid (0.001%) and oleanolic acid present in leaves (*J. Indian Chem. Soc.* 1984, 61, 726).

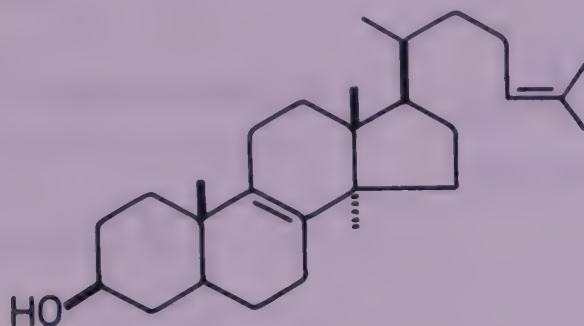
WRIGHTIA (Apocynaceae)

W. tinctoria R.Br. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 436).

Flower extract showed anti-inflammatory activity against carrageenin-induced rat paw oedema (*Indian Drugs* 1984, 22, 158).

Isolation of quercetin and rutin from flowers (*Indian Drugs* 1984, 22, 158); a new sterol - 14 α -methylzymosterol - isolated from seeds along with desmosterol, clerosterol, 24-methylene-25-methylcholesterol and 24-dehydropollinastanol (*Phytochemistry* 1988, 27, 3231).

NEW COMPOUNDS



14 α -Methylzymosterol

XANTHIUM (Asteraceae)

X. strumarium L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 685).

Plant extract exhibited antimicrobial activity against *Proteus vulgaris*, *Staphylococcus aureus*, *Bacillus subtilis*, *Candida albicans* and *Candida pseudotropicalis*; activity was due to presence of xanthol (*Fitoterapia* 1988, 59, 220).

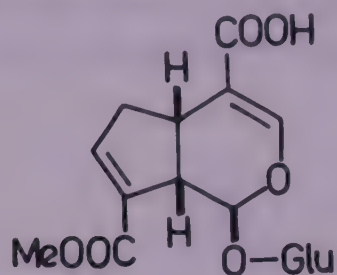
XEROMPHIS (Rubiaceae)

X. spinosa (Thunb.) Keay syn. *Randia dumetorum* Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 686).

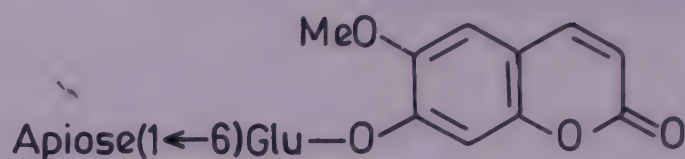
A saponin isolated from pulp and characterised as 3-O-(β -D-xylopyranosyl)olean-12-en-28-oic acid (*Planta Med.* 1986, 52, 72); isolation of an iridoid - 10-methylxoside - from leaves and its structure elucidation (*Phytochemistry* 1986, 25, 2658); two new triterpenoid glycosides isolated from fruits and characterised as 3-O-[β -D-glucopyranosyl(1 \rightarrow 3)- β -D-galactopyranosyl]olean-12-en-3 β -ol-28-oic acid and 3-O-[β -D-glucopyranosyl(1 \rightarrow 2)- β -D-glucopyranosyl(1 \rightarrow 3)- β -D-galactopyranosyl]olean-12-en-3 β -ol-28-oic acid (*Planta Med.* 1987, 53, 530); another triterpene - 1-keto-3 α -hydroxyoleanane - from root bark and its structure elucidation; α - and β -amyrins, oleanolic acid and β -sitosterol also isolated (*Phytochemistry* 1989, 28, 276); a new coumarin glycoside (I) isolated from bark and its structure determined as 7-O-[β -D-apiofuranosyl(1 \rightarrow 6)- β -D-glucopyranosyl]-6-methoxy-coumarin by 2D-NMR; 7-O-[β -D-glucopyranosyl]-6-methoxycoumarin also isolated (*J. Nat. Prod.* 1989, 52, 376); a

haemolytic triterpenoid saponin - randianin - isolated from fruits and its structure determined (*Phytochemistry* 1989, 28, 1544).

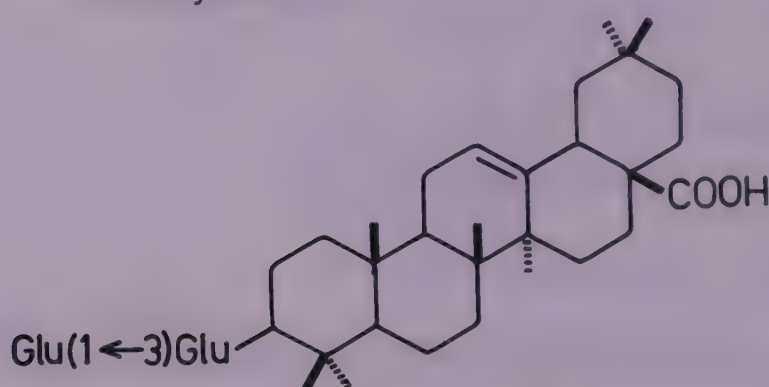
NEW COMPOUNDS



10-Methyloxide



I



Randianin

X. uliginosa (Retz.) Maheshwari syn. *Randia uliginosa* DC. (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 438).

Three saponins isolated from fruits and characterised as olean-3-O- β -D-galactopyranosyl(3 \rightarrow 1)- α -L-arabinopyranosyl-12-en-28-oic acid methyl ester, olean-3-O- β -D-galactopyranosyl-[(6 \rightarrow 1)- β -D-galactopyranosyl](3 \rightarrow 1)- α -L-arabinopyranosyl-12-en-28-oic acid methyl ester and olean-3-O- β -D-glucuronopyranosyl[(4 \rightarrow 1)- β -D-galactopyranosyl](3 \rightarrow 1)- α -L-arabinopyranosyl-12-en-28-oic acid (*Phytochemistry* 1989, 28, 575).

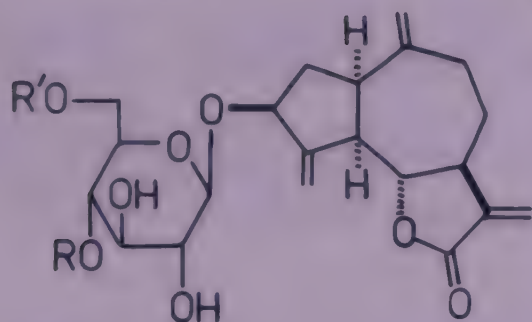
YOUNGIA (Asteraceae)

Y. japonica (L.) DC. syn. *Crepis japonica* (L.) Benth.

Nine new guaianolide type glycosides - crepisides A, B, C, D, E, F, G, H and I - isolated and characterised; glucozaluzanin C also isolated (*Chem. Pharm. Bull.* 1985, 33, 4451).

Distribution : Throughout India, ascending to 3000 m in the Himalayas.

NEW COMPOUNDS

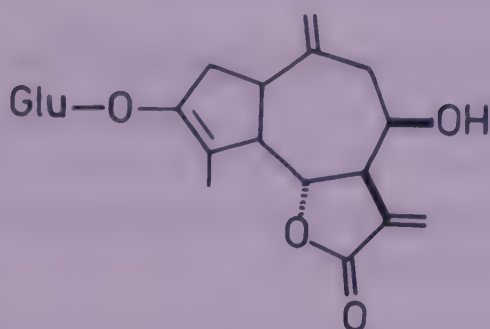


Crepiside A

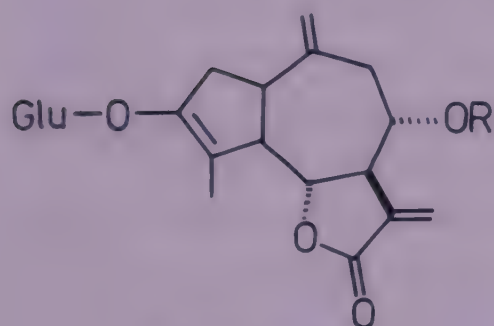
$R = H, R' = p\text{-Hydroxyphenylacetyl}$

Crepiside B

$R = p\text{-Hydroxyphenylacetyl}, R' = H$



Crepiside C

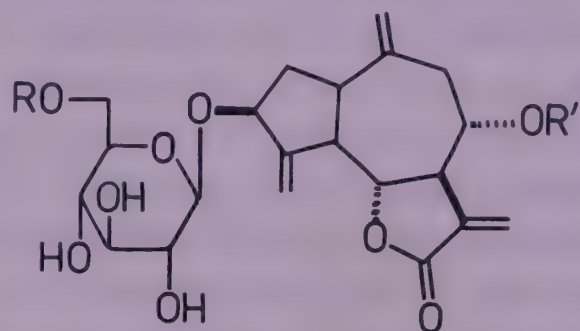


Crepiside D

$R = H$

Crepiside F

$R = p\text{-Hydroxyphenylacetyl}$



Crepiside E

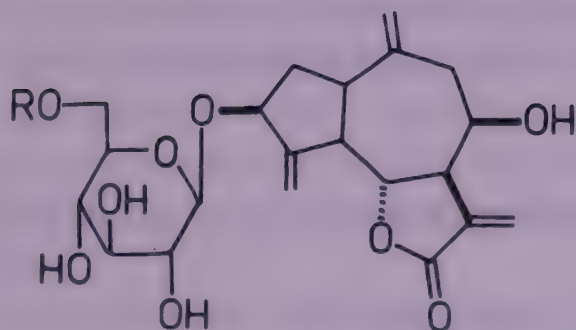
$R, R' = H$

Crepiside G

$R = H, R' = p\text{-Hydroxyphenylacetyl}$

Crepiside H

$R = p\text{-Hydroxyphenylacetyl}, R' = H$



Crepiside I

$R = p\text{-Hydroxyphenylacetyl}$

YUCCA (Liliaceae)

Y. aloifolia L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 687).

Isolation of a new glycoside from leaves and its characterisation as 25(R)5 β -spirostan-3-O- β -D-glucopyranosyl(1 \rightarrow 2)-D-galactopyranoside (*Khim. ~Pri. Soedin.* 1984, 744; *Chem. Abstr.* 1985, 102, 146141 t).

Y. gloriosa L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 687).

Gitogenin, smilagenin and tigogenin isolated from inflorescence; tigogenin content was highest in flower bud (1.35) and flowers (1.0%) during full blossoming (*Rastit. Resur.* 1985, 21, 452; *Chem. Abstr.* 1986, 104, 65931 q); four steroid glycosides - YG-1, YG-2, YG-3 and YG-4 - isolated from flowers and characterised as tigogenin-3-O- β -D-xylopyranosyl(1 \rightarrow 3)[β -D-xylopyranosyl(1 \rightarrow 3)- β -D-glucopyranosyl((1 \rightarrow 2))]- β -D-glucopyranosyl-(1 \rightarrow 4)- β -D-galactopyranoside, gitogenin-3-O- β -D-xylopyranosyl(1 \rightarrow 3)[β -D-xylopyranosyl(1 \rightarrow 3)- β -D-glucopyranosyl(1 \rightarrow 2)]- β -D-glucopyranosyl(1 \rightarrow 4)- β -D-galactopyranoside, gitogenin-3-O- α -L-rhamnopyranosyl(1 \rightarrow 3)[β -D-xylopyranosyl(1 \rightarrow 3)- β -D-glucopyranosyl(1 \rightarrow 2)]- β -D-glucopyranosyl(1 \rightarrow 4)- β -D-galactopyranoside and (22 ξ ,25R)furost-5 α -spirostan-2 α ,22-diol-3-O- β -D-xylopyranosyl(1 \rightarrow 3)- β -D-glucopyranosyl(1 \rightarrow 2)[β -D-xylopyranosyl(1 \rightarrow 3)] β -D-glucopyranosyl(1 \rightarrow 4)- β -D-galactopyranosyl-26-O- β -D-glucopyranoside respectively (*Phytochemistry* 1988, 27, 3235); five more steroidal glycosides YS-I, YS-II, YS-III, YS-IV and YS-V - isolated from fresh flowers and characterised as smilagenin-3-O- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-glucopyranoside, smilagenin-3-O- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-galactopyranoside, smilagenin-3-O- β -D-glucopyranosyl(1 \rightarrow 2)-[β -D-glucopyranosyl(1 \rightarrow 3)]- β -D-glucopyranoside, smilagenin-3-O- β -D-glucopyranosyl(1 \rightarrow 2)[β -D-glucopyranosyl(1 \rightarrow 3)]- β -D-galactopyranoside and samogenin-3-O- β -D-glucopyranosyl(1 \rightarrow 2)- β -D-galactopyranoside respectively; YG-1 and prosapogenin-PS-1 (F-gitonin) also isolated (*Phytochemistry* 1989, 28, 1215).

ZANTHOXYLUM (Rutaceae)

Z. acanthopodium DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 688).

(-)-Asarinin, pluviatilol γ,γ -dimethylallyl ether, piperitol γ,γ -dimethylallyl ether, aesculetin dimethyl ether, skimmianine, acetonyldihydrochelerythrine and β -sitosterol isolated from root (*Zhongcaoyao* 1986, 17, 193; *Chem. Abstr.* 1986, 105, 94500 z); isolation of 5-(3-hydroxypropyl)-7-methoxybenzofuran from roots (*Planta Med.* 1988, 54, 466).

Z. alatum Roxb.; see *Z. armatum* DC.

Z. armatum DC. syn. *Z. alatum* Roxb. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 689).

Anthelmintic activity of extracts of stem bark investigated; ethereal extract exhibited maximum activity against cestodes followed by alcoholic and chloroform extracts (*J. Res. Ayurveda & Siddha* 1981, 2, 340).

β -Sitosterol, pinoresinol dimethyl ether and a mixture of alkaloids isolated from aerial parts (*J. Nepal Chem. Soc.* 1982, 2, 19; *Chem. Abstr.* 1985, 103, 1199874 f); isolation of a monoterpenetriol - 3,7-dimethyl-1-octene-3,6,7- triol - from fruits; linalool (58.30), limonene (24.46), alloaromadendrene (8.98), methyl cinnamate (8.92), myrcene (3.55), α -thujene (1.65), α -fenchol (0.68), p-cymene (0.65), β -caryophyllene (0.50), α -terpineol (0.31), camphor (0.25), 1,8-cineole (0.25), carvone (0.20), tagetonol (0.16), cis-ocimene (0.12) and γ -terpinene (0.08%) determined in fruit oil (*Fitoterapia* 1988, 59, 413); trans-cinnamic acid, nevadensin, umbelliferone, β -sitosterol and its glucoside isolated from fruit (*Indian J. Chem.* 1989, 28B, 356).

Z. budrunga (Roxb.) DC.; see *Z. rhetsa* (Roxb.) DC.

Z. hamiltonianum Wall. ex Hook.f.; see *Z. nitidum* (Roxb.) DC.

Z. myriacanthum Wall. ex Hook.f.

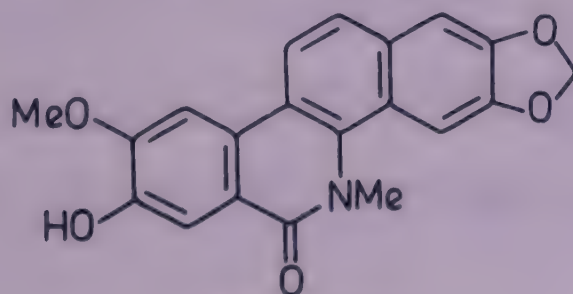
(-)-Asarinin, fargesin, (-)-syringaresinol, γ -sanshool, hydroxy- γ -sanshool, alatamide, dihydroalatamide, tembamide, nitidine and isoarnottianamide isolated from bark (*Yunnan Zhiwu Yanjiu* 1988, 10, 445; *Chem. Abstr.* 1989, 111, 54150 c).

Distribution : Assam and Nagaland.

Z. nitidum (Roxb.) DC. syn. *Z. hamiltonianum* Wall. ex Hook.f. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 689).

A new alkaloid - oxyterihanine - isolated from bark and characterised; nitidine, oxynitidine, 6-methoxy-5,7-dihydrochelerythrine, arnottianamide, liriodenine, bocconoline, decarine, integriamide, isoarnottianamide, (-)-asarinin, (-)-sesamin, (-)-syringaresinol, aesculetin dimethyl ether and β -sitosterol also isolated (*Yakugaku Zasshi* 1984, 104, 1030; *Chem. Abstr.* 1985, 102, 119479 c); synthesis of nitidine (*Tetrahedron Lett.* 1984, 25, 5169).

NEW COMPOUNDS



Oxyterihanine

Z. rhetsa (Roxb.) DC. syn. *Z. budrunga* (Roxb.) DC. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 690).

Determination of (-)-sabinene (50.0%) in oil by GC-MS (*Flavour Fragrance J.* 1986, 1, 165; *Chem. Abstr.* 1987, 107, 140858 p).

ZEA (Poaceae)

Z. mays L. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 690).

Kaempferol-3-O-glucoside, quercetin-3-O-glucoside, -3,7-O-diglucoside, -3,3'-O-diglucoside, -3-O-neohesperidoside and -3-O-glucosido-3'-O-diglucoside and isorhamnetin-3-O-glucoside, -3,4'-O-diglucoside, -3-O-neohesperidoside and -3-O-glucosido-4'-O-diglucoside isolated from pollens (*Phytochemistry* 1984, 23, 1822); zeanin isolated from sweet immature kernels (*Shinshu Daigaku Nogakubu Kiyo* 1984, 21, 195; *Chem. Abstr.* 1985, 103, 19863 a).

BIOLOGICAL ACTIVITY

When grape cluster were dipped before blossom, in solution of zeanin (50.0 µg/ml), the fruit set increased about three-fold (*Shinshu Daigaku Nogakubu Kiyo* 1984, 21, 195; *Chem. Abstr.* 1985, 103, 19863 a).

ZEBRINA (Commelinaceae)

Z. pendula Schnizl.

Three acylated anthocyanins isolated from aerial parts and characterised as 3-O-β-D-glucopyranosyl-7-O-(6-O-caffeoyl)-β-D-glucopyranosyl-3'-O-(6-O-caffeoyl)-β-D-glucopyranosyl cyanidin, 7-O-(6-O-caffeoyl)-β-D-glucopyranosyl-3'-O-(6-O-caffeoyl)-β-D-glucopyranosyl cyanidin and 3-O-[6-O-(2,5-O-dicaffeoyl)-D-xylopyranosyl]-β-D-glucopyranosyl-7-O-[(6-O-caffeoyl)-β-D-glucopyranosyl]-3'-O-[(6-O-caffeoyl)-β-D-glucopyranosyl]cyanidin (*Jpn.* 62,127,355 (1987) Jun. 09; *Chem. Abstr.* 1988, 108, 19395 c).

Distribution : Native of Mexico, introduced into Indian gardens.

ZEPHYRANTHES (Amaryllidaceae)

Z. carinata Herb. syn. *Z. grandiflora* Lindl. (*Compend. Indian Med. Plants*, Vol. 2, Rastogi & Mehrotra, PID, New Delhi, 1991, p. 717).

Pancratistatin isolated from bulbs (*J. Nat. Prod.* 1984, 47, 1018).

BIOLOGICAL ACTIVITY

Pancratistatin was active against murine P-388 lymphocytic leukaemia (*J. Nat. Prod.* 1984, 47, 1018).

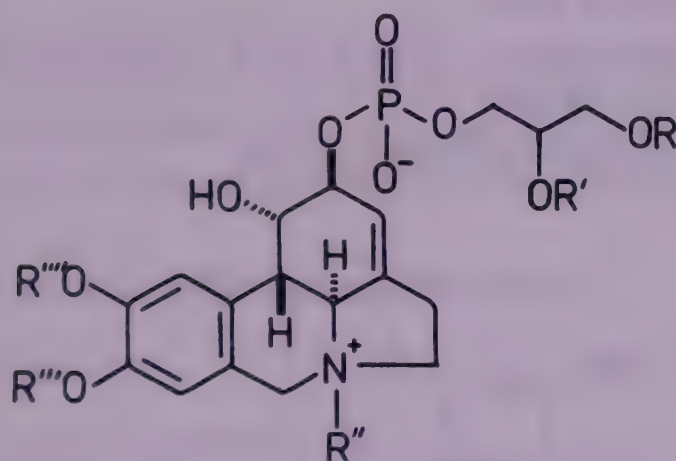
Z. flava Roem. & Schult.

Eng. - Zephyr flower, Thunder flower. 9

A new optically-active flavan - 7-hydroxy-3',4'-methylenedioxyflavan - and its 7-glucoside isolated along with 7,4'-dihydroxy-3'-methoxyflavan and 7-methoxy-2'-hydroxy-4',5'-methylenedioxyflavan; new compound characterised (*Phytochemistry* 1985, 24, 151); isolation of two new alkaloids - zefbetaine and zeflabetaine - from mature seeds and their structure elucidation; crinamine, haemanthamine, lycorine, its 1-O- β -D-glucoside, maritidine, methylpseudolycorine, narciclassine, pratorimine, kalbreclassine, criasbetaine, ungeremine, pretazettine, haemanthidine, pseudolycorine and its 1-O- β -D-glucoside also isolated (*Phytochemistry* 1986, 25, 1975); new pyrrolophenanthridine phospholipids - 2-O-glycerophosphoryllycorine, phosphatidyllycorines (I, II), phosphatidylpseudolycorines (III, IV) and phosphatidyllycorinium methocation (V) - isolated from flowers and their structures elucidated (*Phytochemistry* 1987, 26, 823).

Distribution : Native to America, introduced into Indian gardens.

NEW COMPOUNDS



2-O-Glycerophosphoryllycorine

$R, R', R'' = H, R''', R'''' = -CH_2-$

I

$R = \text{Palmitoyl}, R' = \text{Stearoyl}, R'' = H, R''', R'''' = -CH_2-$

II

$R = \text{Palmitoyl}, R' = \text{Oleoyl}, R'' = H, R''', R'''' = -CH_2-$

III

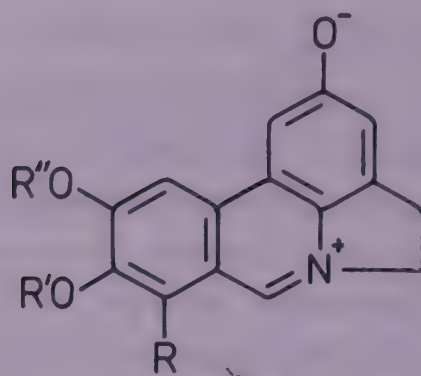
$R = \text{Palmitoyl}, R' = \text{Stearoyl}, R'', R'''' = H, R''' = \text{Me}$

IV

$R = \text{Palmitoyl}, R' = \text{Oleoyl}, R'', R'''' = H, R''' = \text{Me}$

V

$R = \text{Palmitoyl}, R' = \text{Stearoyl}, R'' = \text{Me}, R''', R'''' = -CH_2-$



Zefbetaine

R, R' = H, R'' = Me

Zeflabetaine

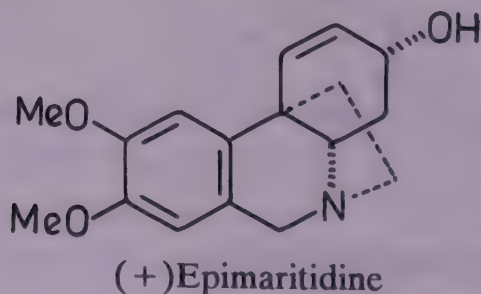
R = OMe, R'R'' = -CH₂-*Z. grandiflora* Lindl.; see *Z. carinata* Herb.*Z. rosea* Lindl.

Eng. - Zephyr flower, Thunder flower.

A new alkaloid - (+)epimaritidine - isolated and its structure and stereochemistry established (*Phytochemistry* 1985, 24, 635).

Distribution : Native to America, grown in Indian gardens.

NEW COMPOUNDS



(+)Epimaritidine

ZINGIBER (Zingiberaceae)

Z. officinale Rosc. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 690).

β -Bisabolene, ar-curcumene, α -farnesene and zingiberene identified in oil from rhizomes of Indian plant, whereas rhizome oil from Australian plant contained camphene, 1,8-cineole, geranial, neral and phellandrene (*Z. Lebensm.-Unters. Forsch.* 1988, 186, 231; *Chem. Abstr.* 1988, 109, 61340 b).

BIOLOGICAL ACTIVITY

(6)-Shogaol (0.5 mg/kg, i.v.) showed triphasic effect on blood pressure in rats, an initial fall followed by marked pressor response, bradycardia and apnea. It induced contractile

response in isolated guinea pig trachea at $100.0 \mu\text{M}$ and showed positive inotropic and chronotropic activities on isolated atria in rats at $3.6 \mu\text{M}$ (*Nippon Yakurigaku Zasshi* 1986, 88, 339; *Chem. Abstr.* 1987, 106, 12347 p; *J. Pharmacobio-Dyn.* 1986, 9, 842; *Chem. Abstr.* 1987, 106, 131425 x); gingerols I and II from rhizomes potentiated contractions induced by prostanooids (except PGD₂) and inhibited contractions produced by PGD₂, TXA₂ and LT on isolated blood vessels of mice and rats. Because of their prostaglandin-related chemical structures, gingerols acted as modulator of eicosanoid responses in vascular smooth muscles (*Jap. J. Pharmacol.* 1989, 50, 253).

Z. zerumbet (L.) Smith (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 693).

Synthesis of zerumbone (*Chem. Pharm. Bull.* 1987, 35, 4039).

ZINNIA (Asteraceae)

Z. elegans Jacq.

H. - Zinnia.

Total flavonoid content 1.3% in influorescences; apigenin-7-glucoside (0.3%), apigenin-4'-glucoside, kaempferol-3-glucoside, kaempferol-3-xyloside-7-glucoside, quercetin-3-glucoside and luteolin-7-glucoside isolated (*Herba Pol.* 1983, 29, 197; *Chem. Abstr.* 1985, 103, 3694 k).

Distribution : Native of Mexico, grown in Indian gardens.

ZIZYPHUS (Rhamnaceae)

Z. jujuba Lamk.; see *Z. mauritiana* Lamk.

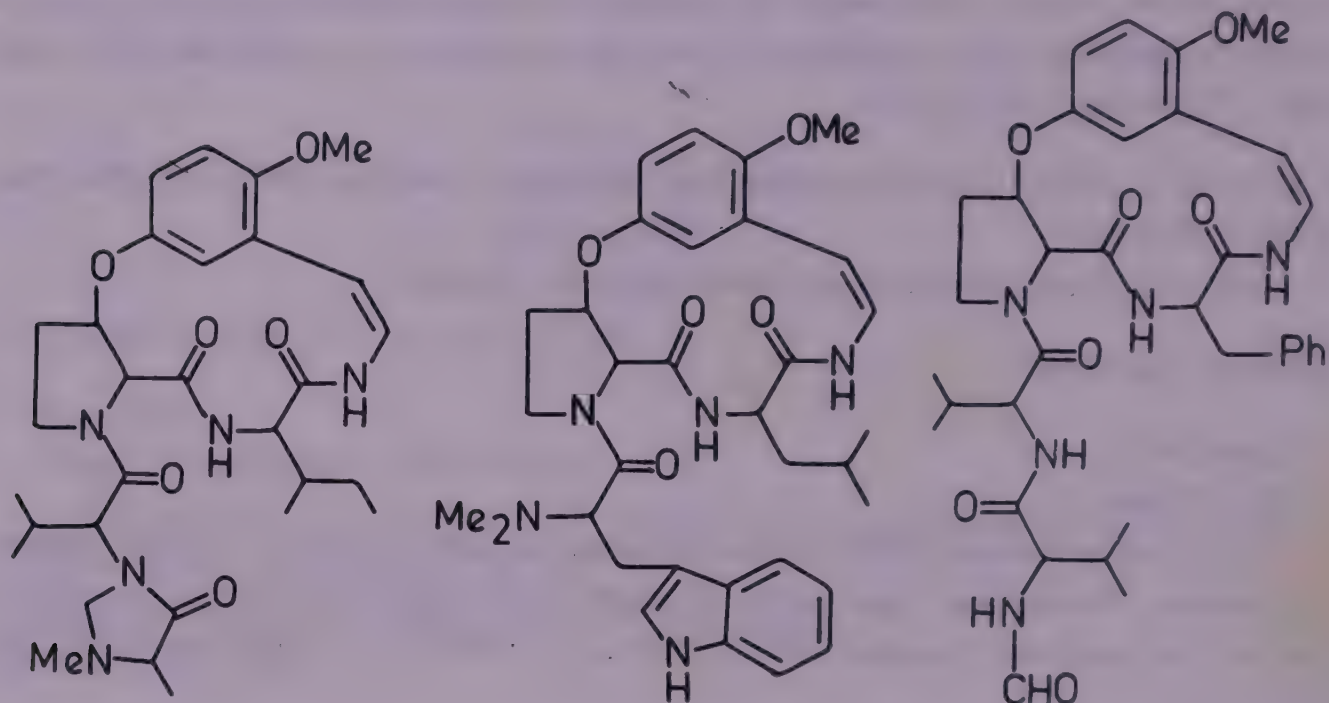
Z. jujuba Mill. syn. *Z. sativa* Gaertn., *Z. vulgaris* Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 694).

Bark used in healing ulcers and wounds (*Planta Med.* 1986, 52, 500).

New cyclopeptide alkaloid - sativanine D - isolated and its structure elucidated (*Phytochemistry* 1985, 24, 2765); another alkaloid - sativanine E - and its characterisation (*J. Nat. Prod.* 1985, 48, 555); cyclopeptide alkaloid - sativanine F - from bark and its structure determination (*Phytochemistry* 1985, 24, 2768); sativanine G - from bark and its structure elucidation (*Phytochemistry* 1984, 23, 2120); identification of franguloline, nummularine B, mucronine D and sativanines A, B, C, D, E, F and G in bark (*Nat. Prod. Chem., Proc. Int. Symp. Pak.-U.S. Binatl. Workshop*, Ist 1986, 404; *Chem. Abstr.* 1987, 106, 153052 a); another cyclopeptide alkaloid - sativanine H - from bark and its characterisation (*Planta Med.* 1986, 52, 500); a neolignan (I) isolated (*Planta Med.* 1986, 52, 501); a N-formylcyclopeptide alkaloid - sativanine K - isolated and its structure established (*Phytochemistry* 1987, 26, 1230); betulin,

betulinic acid, kaempferol, myricetin, β -sitosterol and its glucoside isolated from bark (*Fitoterapia* 1987, 58, 58); cyclopeptide alkaloid - tscheschamine - isolated from bark and its structure determined (*Heterocycles* 1988, 27, 2777); synthesis of neolignan (I) (*Ann. Chem.* 1989, 593).

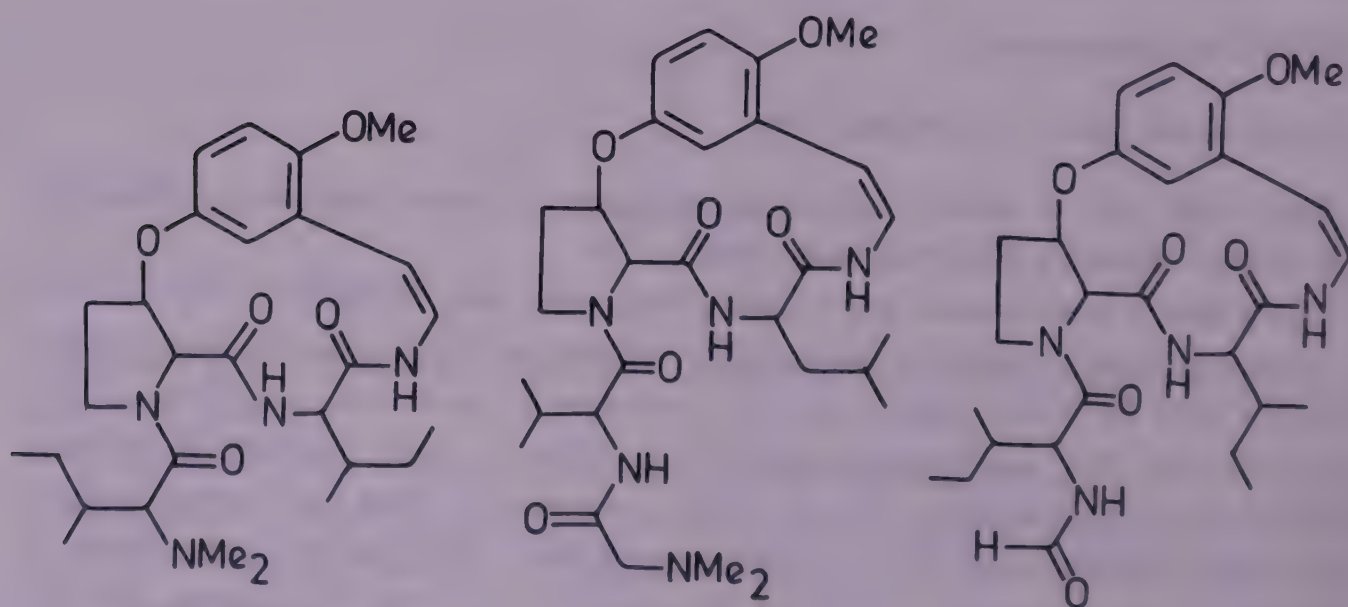
NEW COMPOUNDS



Sativanine D

Sativanine E

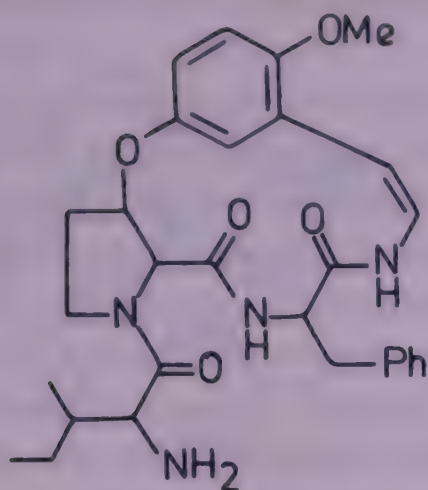
Sativanine F



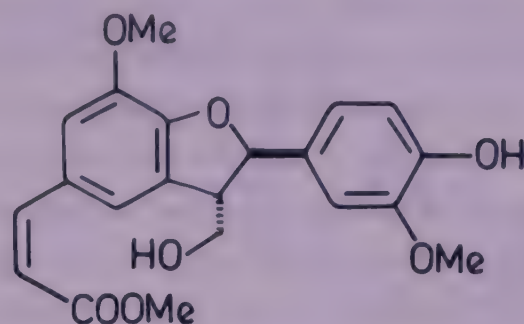
Sativanine G

Sativanine H

Sativanine K



Tscheschamine



I

BIOLOGICAL ACTIVITY

Neolignan (I) showed significant induction effect on release of endogenous PGI₂ from rat aorta (*Planta Med.* 1986, 52, 501).

Z. mauritiana Lamk. syn. *Z. jujuba* Lamk. (non Mill.) (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 694).

A peptide alkaloid - frangufoline - isolated (*Phytochemistry* 1987, 26, 3374); isolation of a flavonoid - spinosin - from seeds (*Zhongyao Tongbao* 1987, 12, 546; *Chem. Abstr.* 1988, 108, 568 q).

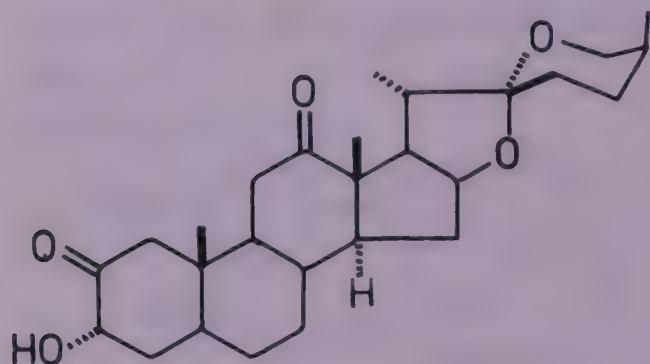
BIOLOGICAL ACTIVITY

Spinosin showed sedative and hypnotic effects in mice (*Zhongyao Tongbao* 1987, 12, 546; *Chem. Abstr.* 1988, 108, 568 q).

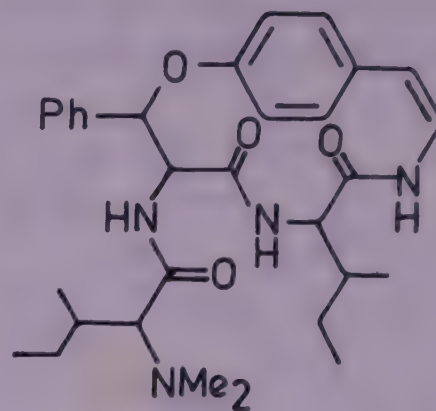
Z. nummularia (Burm.f.) W. & A. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 695).

A new spirostane - nummularogenin - isolated and characterised (*J. Nat. Prod.* 1984, 47, 781); isolation of two new cyclopeptide alkaloids - nummularines M and N - and their structure determination; nummularine B also isolated (*Phytochemistry* 1984, 23, 2118); another cyclopeptide alkaloid - nummularine O (N-desmethyljubanine B) - from root bark and its characterisation; jubanines A and B and mauritine also isolated (*Fitoterapia* 1985, 56, 363); nummularine O also isolated from stem bark along with jubanine B (*Phytochemistry* 1986, 25, 2690); another cyclopeptide alkaloid - nummularine P - from stem bark and its structure elucidation; mauritine D also isolated (*J. Nat. Prod.* 1987, 50, 235); cyclopeptide alkaloid - nummularine R - isolated and its structure determined; frangufoline also isolated (*Phytochemistry* 1987, 26, 3374); isolation of nummularine E from stem bark (*J. Pure Appl. Sci.* 1988, 7, 31; *Chem. Abstr.* 1989, 110, 209341 w); another cyclopeptide alkaloid - nummularine S - isolated from stem bark and its structure established (*Phytochemistry* 1989, 28, 305).

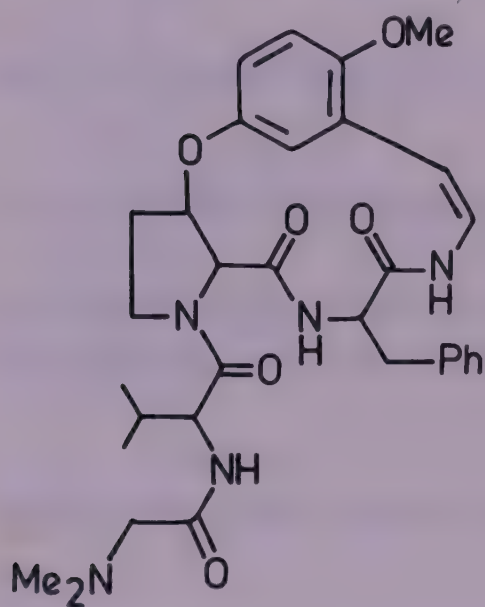
NEW COMPOUNDS



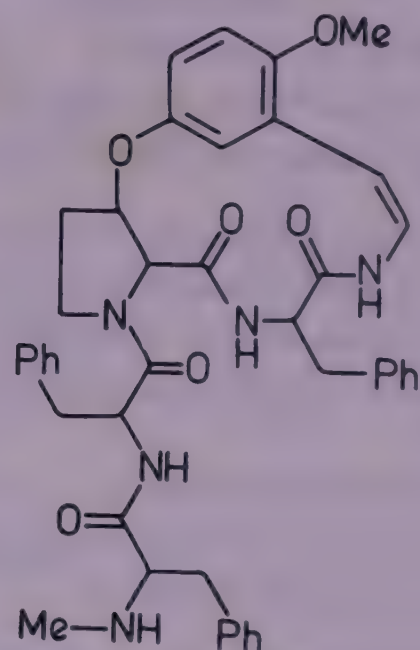
Nummularogenin



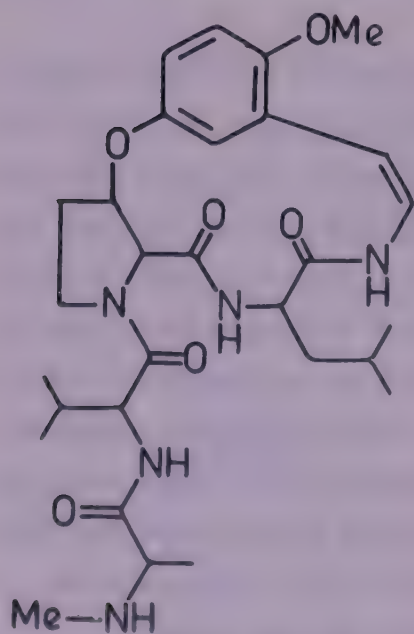
Nummularine M



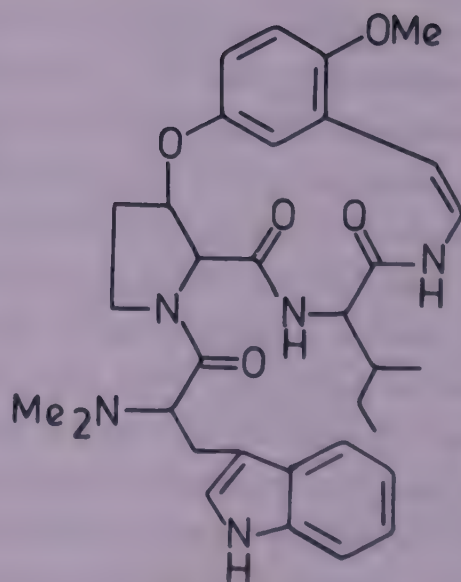
Nummularine N



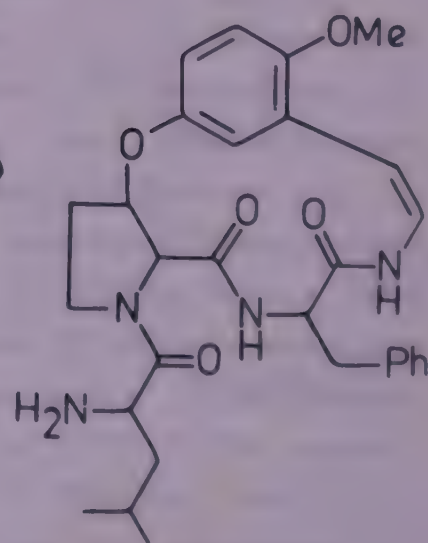
Nummularine O



Nummularine P



Nummularine R



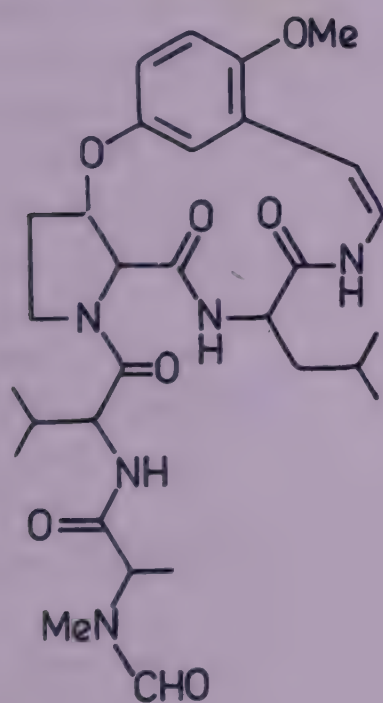
Nummularine S

Z. rugosa Lamk. (*Compend. Indian Med. Plants*, Vol. 3, Rastogi & Mehrotra, PID, New Delhi, 1993, p. 696).

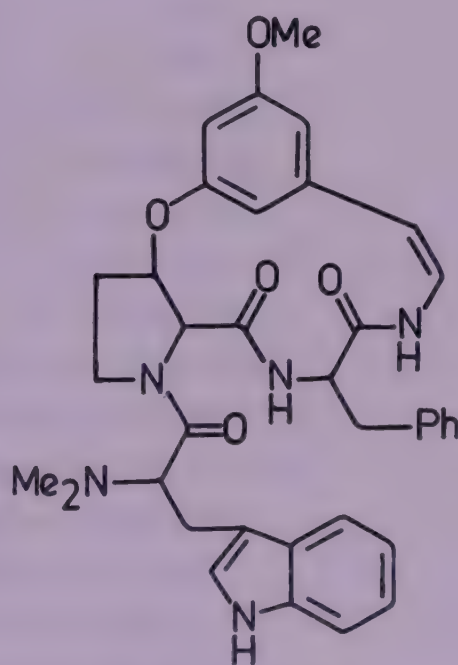
Bark extract at dose of 0.1 to 1.0 g/kg, i.p., produced dose-dependent decrease in alertness and locomotor activity in mice, thus, exhibiting CNS-depressant activity. In the range of 25.0 to 100.0 mg/kg, i.p., it showed significant analgesic activity (*Indian J. Pharmacol.* 1988, 20, 200).

Kaempferol-3-rhamnoside, quercetin-3-rhamnoside, myricetin-3-rhamnoside, β -sitosterol and its glucoside isolated from bark (*J. Chem. Soc. Pak.* 1985, 7, 33; *Chem. Abstr.* 1985, 103, 68322 g); stem afforded n-nonacosane, octacosanol and betulinic acid (*Indian Drugs* 1987, 24, 323); kaempferol, quercetin, myricetin, apigenin, its 7-O-glucoside, betulin, betulinic acid and vanillic acid isolated from bark (*Fitoterapia* 1988, 59, 158); new cyclopeptide alkaloid - rugosanine A - from stem bark and its structure determination (*Phytochemistry* 1988, 27, 1915); another alkaloid - rugosanine B - isolated from bark along with nummularine P and sativanine H; rugosanine B characterised (*Phytochemistry* 1989, 28, 1563).

NEW COMPOUNDS



Rugosanine A



Rugosanine B

Z. sativa Gaertn.; see *Z. jujuba* Mill.

Z. vulgaris Lamk.; see *Z. jujuba* Mill.

Z. xylopyrus (Retz.) Willd. (*xylopyra*, *xylophora*) (*Compend. Indian Med. Plants*, Vol. 1, Rastogi & Mehrotra, PID, New Delhi, 1990, p. 442).

Bark extract (0.2 g/kg, i.p.) showed significant antinociceptive activity in rats 1 hr after its administration. Its anticonvulsant activity was determined against supramaximal electroshock seizure in rats of either sex. Pretreatment of rats with extract (0.2 g/kg, i.p., 1 hr) provided

significant protection (50%) against electroshock-induced convulsions and the same pretreatment markedly inhibited carrageenin-induced oedema. Pretreatment with 0.1 mg/kg, i.p., 1 hr, increased pentobarbitone-induced sleeping time of male mice, suggesting that extract possessed CNS depressant activity (*Indian J. Pharmacol.* 1987, 19, 63).

Two cyclopeptide alkaloids - mauritine D and nummularine B (N-demethylamphibine H) - isolated from bark (*J. Nat. Prod.* 1986, 49, 939); isolation of amphibine H and nummularine K (*Phytochemistry* 1987, 26, 3374).

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Abbreviations used: B.-Bengal; Bo.-Bombay; Eng.-English; Guj.- Gujarat; H.-Hindi; Kan.- Kanarese; Kash.-Kashmir; Mal.-Malayalam; Mar.-Maharashtra; Nep.-Nepal; P.-Punjab; S.- Sanskrit; Tam.-Tamil; Tel-Telugu.

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Dr. R.P. Rastogi has been associated with the Central Drug Research Institute, Lucknow, for almost 42 years since its inception. After retiring from the post of Deputy Director, Medicinal Chemistry Division, he held the position of Emeritus Scientist and is presently a Consultant to the Institute. Dr. Rastogi obtained Ph.D. degree from Lucknow University and was a Research Associate at the University of Wisconsin, Madison, USA, for almost two years. His research interests have been in the broad area of natural products and traditional drugs and has made significant contributions to the chemistry of saponins, sesqui-, di-, and triterpenoids, cardenolides, coumarins, iridoids and lignans. He was the Coordinator of the composite CDRI research programme on medicinal plants for nearly a decade. He has published over 130 research papers and almost 20 reviews and book articles. He has been WHO Consultant to the Governments of Burma and Bangladesh for drawing of physico-chemical research programmes on traditional drugs.

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